DEPARTMENT OF ENVIRONMENTAL CONSERVATION

AIR QUALITY OPERATING/CONSTRUCTION PERMIT

Permit No. AQ0455TVP01
Application No. 455
Revision 2: January 15, 2008

Issue Date: November 17, 2003
Expiration Date: December 31, 2008

The Department of Environmental Conservation, under the authority of AS 46.14 and 18 AAC 50, issues an operating/construction permit to the Permittee, **BP Exploration (Alaska) Inc.**, for the operation of **Transportable Drilling Rigs**.

This permit only authorizes emissions from drilling operations that qualify as temporary operations under AS 46.14.215. This permit authorizes emissions only from drilling operations conducted at aggregated well pads governed by a separate stationary source-specific operating permit within the lease areas specified in Section 1 of the permit. This permit does not authorize drilling operations at sales oil production pads governed by a stationary source operating permit, except as authorized by condition 7.

This permit only authorizes emissions from the drilling rigs identified in Section 16 of the permit. Use of alternative drilling rigs will require a permit revision in accordance with 18 AAC 50.370. If a separate air quality permit is issued in the future that implements site-specific requirements for operation of a drill rig or rigs at a well pad within the lease areas specified in Section 1 of this permit, then this permit will become null and void with respect to that well pad and will be rescinded and replaced by the site-specific permit for that location.

This permit satisfies the obligation of the owner and operator to obtain an operating/construction permit as set out in AS 46.14.130(b). As set out in AS 46.14.120(c), the Permittee shall comply with the terms and conditions of this operating/construction permit.

All stationary source-specific terms and conditions of Air Quality Control Permit-to-Operate Nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020 have been incorporated into this Operating/Construction Permit. This permit, in accordance with the provisions of 18 AAC 50.305(a)(3), revises or rescinds specific terms and conditions of Air Quality Control Permit-to-Operate Nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020.

This Operating/Construction Permit becomes effective January 1, 2004.

John F. Kuterbach, Manager
Air Permits Program

January 15, 2008

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List of Abbreviations Used in this Permit

AAC.....Alaska Administrative Code
ADEC .....Alaska Department of Environmental Conservation
AS .....Alaska Statutes
ASTM .....American Society for Testing and Materials
BACT.....Best Available Control Technology
bbl .....U.S. Petroleum Barrels (42 gallons)
C.F.R.....Code of Federal Regulations
CO.....Carbon Monoxide
dscf.....Dry standard cubic foot
EPA.....US Environmental Protection Agency
gr./dscf.....grain per dry standard cubic foot (1 pound = 7000 grains)
GPH .....gallons per hour
HAPs or HACs ....Hazardous Air Pollutants or Hazardous Air Contaminants [*HAPs* or *HACs* as defined in AS 46.14.990(14)]
ID .....Emission unit Identification Number
kPa .....kiloPascals
LAER.....Lowest Achievable Emission Rate
MACT.....Maximum Achievable Control Technology as defined in 40 C.F.R. 63.
MR&R .....Monitoring, Recordkeeping, and Reporting
NESHAPs.....Federal National Emission Standards for Hazardous Air Pollutants [*NESHAPS* as contained in 40 C.F.R. 61 and 63]
NO_X .....Nitrogen Oxides
NSPS.....Federal New Emission unit Performance Standards [*NSPS* as contained in 40 C.F.R. 60]
O & M.....Operation and Maintenance
O_2.....Oxygen
PM-10 .....Particulate Matter less than or equal to a nominal ten microns in diameter
ppm .....Parts per million
ppmv.....Parts per million by volume
ppmvd.....Parts per million by volume on a dry basis
psia.....Pounds per Square Inch (absolute)
PSD.....Prevention of Significant Deterioration
PTE.....Potential to Emit
SIC.....Standard Industrial Classification
SO_2.....Sulfur dioxide
TPH.....Tons per hour
TPY.....Tons per year
VOC.....volatile organic compound [*VOC* as defined in 18 AAC 50.990(103)]
VOL.....volatile organic liquid [*VOL* as defined in 40 C.F.R. 60.111b, Subpart Kb]
vol%.....volume percent
wt%.....weight percent

Section 1. Identification

Names and Addresses

Permittee:

BP Exploration (Alaska) Inc.
900 East Benson Blvd. (zip 99508)
P.O. Box 196612
Anchorage, AK 99519-6612

Stationary Source Name:

Transportable Drilling Rigs

Locations:

At well pads governed by a separate stationary source-specific operating permit within the North Slope Drilling Area bounded by the Colville River, the Canning River, the Beaufort Sea (including off-shore 3 miles), and latitude 69° 30', and may include Mikkelsen Bay exploratory well pads in Sections 10, 11, 14 and 20, Township 9 North, Range 20 East, Umiat Meridian (east of Shaviok River and southeast of Tigvariak Island). Sales oil production pads governed by a stationary source operating permit are not included, except as stated in condition 7 of this permit.

Physical Address:

Prudhoe Bay, Alaska

Owners:

Doyon Drilling
101 W. Benson Blvd.
Suite 503
Anchorage, AK 99503

Nabors Alaska Drilling, Inc.
2525 C Street, Suite 200
Anchorage, AK 99503

Nordic-Calista Services, Inc.
4700 Business Park Boulevard, Suite 19
Anchorage, AK 99503

Operator:

Same as Permittee

Permittee's Responsible Official:

Gary E. Christman, ADW Manager

Designated Agent:

CT Corporation
Juneau, AK

Stationary Source Contact:

Mary Cocklan-Vendl, ADW HSE Advisor
(907) 564-4766

Fee Contact:

James A. Pfeiffer, Air Specialist
pfeiffja@bp.com

Stationary Source Process Description

SIC Code of the Stationary Source: 1311 Crude Petroleum and Natural Gas Production
NAICS Code of the Stationary Source: 211111

[18 AAC 50.350(b)(1), 1/18/97]

Section 2. General Emission Information

[18 AAC 50.350(b)(1), 1/18/97]

Emissions of Regulated Air Contaminants, as provided in the Permittee's application(s):

Nitrogen Oxides, Carbon Monoxide, Sulfur Dioxide, Particulate Matter (PM-10), Volatile Organic Compounds, and various Hazardous Air Pollutants (HAPs)

Operating Permit Classifications:

1. 18 AAC 50.325(b)(1) Stationary source will operate at well pads governed by a separate stationary source-specific operating permit for a stationary source that has the potential to emit 100 tpy or more of a regulated air contaminant.

Stationary Source Classifications: None

Section 3. Emission unit Inventory and Description

[18 AAC 50.350(d)(2), 1/18/97]

Generic emission unit types listed in Table 1 have specific monitoring, recordkeeping, or reporting conditions in this permit. Use of incinerators or flares is not authorized in conjunction with drilling activities at any well pad governed by this permit.

The generic emission unit types listed in Table 1 are authorized for use by the Permittee in conjunction with up to twelve transportable drilling rigs operating concurrently at aggregated well pads within the North Slope Drilling Area specified in Section 1.

Table 1 – Generic Drilling Rig Emission Unit Types with MR&R

Operating Group	Emission Unit Group
Drill Rig Emission Units	Nonroad Engines
	Heaters and Boilers
Camp Emission Units	Nonroad Engines
	Heaters and Boilers

The individual transportable drilling rigs and their associated emission units operating under this permit are identified in Section 16 of this permit. The specific number of emission units and the actual make/model of the units comprising the individual transportable drilling rigs utilized may vary.

Section 4. Emission Fees

1. **Assessable Emissions.** The Permittee shall pay to the Department an annual emission fee based on each rig stationary source's assessable emissions as determined by the Department under 18 AAC 50.410. The assessable emission fee rate is set out in 18 AAC 50.410(b). The Department will assess fees per ton of each air contaminant that the stationary sources emit or have the potential to emit in quantities greater than 10 tons per year. The quantity for which fees will be assessed for each rig operated during the calendar year is the lesser of

   1.1 the total assessable potential to emit from drill rig emission units located at an individual well pad of 269 TPY (3,228 TPY total for twelve rigs operating at up to twelve different well pads); or

   1.2 the projected annual rate of emissions that will occur from July 1 to the following June 30, based upon actual annual emissions emitted during the most recent calendar year or another 12 month period approved in writing by the Department, when demonstrated by

      a. an enforceable test method described in 18 AAC 50.220;

      b. material balance calculations;

      c. emission factors from EPA's publication AP-42, Vol. I, adopted by reference in 18 AAC 50.035; or

      d. other methods and calculations approved by the Department.

   [18 AAC 50.346(a)(1), 5/3/02 and 18 AAC 50.350(c) & 50.400 – 50.420, 1/18/97]

2. **Assessable Emission Estimates.** Emission fees will be assessed as follows:

   2.1 no later than March 31 of each year, the Permittee may submit an estimate of the stationary source's assessable emissions to ADEC, Air Permits Program, ATTN: Assessable Emissions Estimate, 410 Willoughby Avenue, Po Box 111800, Juneau, AK 99811-1800; the submittal must include all of the assumptions and calculations used to estimate the assessable emissions in sufficient detail so the Department can verify the estimates; or

   2.2 if no estimate is received on or before March 31 of each year, emission fees for the next fiscal year will be based on the potential to emit set forth in condition 1.1.

   [18 AAC 50.346(a)(1), 5/3/02 and 18 AAC 50.350(c) & 50.400 – 50.420, 1/18/97]

Section 5. Emission unit-Specific Requirements

Fuel-Burning Equipment (excluding nonroad engines)

3. **Visible Emissions.** The Permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from each emission unit within Emission Unit Group category "Heaters and Boilers" listed in Table 1, for each transportable drilling rig, to reduce visibility through the exhaust effluent by any of the following:

    a. more than 20 percent for a total of more than three minutes in any one hour[1];

    [18 AAC 50.050(a), 18 AAC 50.055(a)(1), 1/18/97 and 18 AAC 50.350(d)(1)(C), 6/21/98]
    [40 C.F.R. 52.70, 7/01/01]

    b. more than 20 percent averaged over any six consecutive minutes[2].

    [18 AAC 50.050(a), 18 AAC 50.055(a)(1) & 50.346(c), 5/3/02 and 18 AAC 50.350(d)(1)(C), 6/21/98]

    3.1 For each significant emission unit with a rated capacity equal to or greater than 1.7 MMBtu/hr within Emission Unit Group category "Heaters and Boilers" operated for each transportable drilling rig, monitor, record, and report visible emissions in accordance with Section 7.

    [18 AAC 50.350(g) - (i) & 50.346(c), 5/3/02]

4. **Particulate Matter.** The Permittee shall not cause or allow particulate matter emitted from each emission unit within Emission Unit Group category "Heaters and Boilers" listed in Table 1, for each transportable drilling rig, to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

    [18 AAC 50.346(c), 5/3/02; 18 AAC 50.055(b)(1), 1/18/97 and 18 AAC 50.350(d)(1)(C), 6/21/98]

    4.1 For each significant emission unit with a rated capacity equal to or greater than 1.7 MMBtu/hr within Emission Unit Group category "Heaters and Boilers", operated for each transportable drilling rig, monitor, record and report in accordance with Section 7.

    [18 AAC 50.346(c) & 50.350(g) – (i), 5/3/02]

5. **Sulfur Compound Emissions.** In accordance with 18 AAC 50.055(c), the Permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, from each emission unit within Emission Unit Group category "Heaters and Boilers", for each transportable drilling rig, to exceed 500 ppm averaged over three hours.

    [18 AAC 50.346(c), 5/3/02; 18 AAC 50.055(c), 1/18/97; and 18 AAC 50.350(d)(1)(C), 6/21/98]

    5.1 The Permittee shall include in the operating report required by condition 44 a list of the fuel sulfur content measured by the supplier for each shipment of fuel for each month covered by the report.

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[1] For purposes of this permit, the "more than three minutes in any one hour" criterion in this condition and condition 16 will no longer be effective when the Air Quality Control (18 AAC 50) regulation package effective May 3, 2002 is adopted by the U.S. EPA.

[2] The six-minute average standard is enforceable only by the state until 18 AAC 50.055(a)(1), dated May 3, 2002, is approved by EPA into the SIP at which time this standard becomes federally enforceable.

5.2 If the fuel contains greater than 0.75 percent sulfur by weight, the Permittee shall calculate SO_2 emissions in ppm using either the SO_2 material balance calculation in Section 15 or Method 19 of 40 C.F.R. 60, Appendix A-7, adopted by reference in 18 AAC 50.040(a).

5.3 If SO_2 emissions are calculated under condition 5.2 to exceed 500 ppm, the Permittee shall report under condition 43. The report shall document the calculation under condition 5.2.

5.4 For fuel with a sulfur content greater than 0.75% by weight, the Permittee shall include in the operating report required by condition 44 the calculated SO_2 emissions in PPM.

[18 AAC 50.350(g) - (i) & 18 AAC 50.346(c), 5/3/02]
[18 AAC 50.350(d)(1)(D), 1/18/97]
[Operating Permit Nos. 9573-AA016, 9573-AA017, 9573-AA018, 9573-AA019 & 9573-AA020, 11/29/96]

Section 6. Source-Wide Requirements

Fuel Usage Limits

6. The Permittee shall limit the total daily and aggregate rolling 12-month fuel usage based on the sulfur content of the liquid fuel burned as specified in Table 2. These daily and annual fuel use limits apply separately to each well pad, and are cumulative for all drill rig emission units and associated equipment listed in Table 1, and by reference Section 16, that operates at a well pad during the time periods indicated by each limitation. These limits are also cumulative with respect to the operation of multiple rigs on a given well pad, such that the limits represent the total fuel use available for all drilling operation emission units during the daily and annual time periods. Limits are not to be exceeded.

6.1 The Permittee shall monitor and record the aggregated daily total and rolling 12-month total fuel usage by all drill rig operations emission units described under Table 1 for each well pad where drill rig operations are authorized under this permit.

6.2 Report the data recorded under condition 6.1 for all well pad locations where drill rig operations are authorized under this permit using the operating report under condition 44.

6.3 Notify the Department per condition 43 if the aggregate daily fuel usage or the aggregate rolling 12-month total fuel usage at any well pad location where drill rig operations are authorized under this permit exceeds a limit in Table 2.

[18 AAC 50.350(g) – (i), 5/3/02]
[18 AAC 50.335(g)(1), 1/18/97]

Table 2 – Liquid Fuel Use Limits

Liquid Fuel Sulfur Content (up to)	Total Daily Fuel Use Limit	Total Rolling 12-Month Fuel Use Limit
0.15% by weight	18,000 gal	1,250,000 gal
0.20% by weight	13,440 gal	
0.25% by weight	10,800 gal	

Drilling Location and Site Restrictions

7. The Permittee shall operate the permitted Transportable Drilling Rig(s) within the North Slope Drilling Area specified in Section 1. Operation at excluded sites, i.e. sales oil production pads governed by a stationary source operating permit, shall not occur without first obtaining written authorization from the Department following submittal of a demonstration that Ambient Air Quality Standards are protected.

[Operating Permit Nos. 9573-AA016, 9573-AA017, 9573-AA018, 9573-AA019 & 9573-AA020, 11/29/96]

8. The Permittee may concurrently operate up to twelve drilling rigs, drawn from the pool of rigs identified in Section 16 of this permit, at well pads where drilling activities are authorized by this permit.

[18 AAC 50.335(g)(1), 1/18/97]

9. The Permittee shall use this permit at aggregated well pads for temporary construction activity[3] only. Extension beyond the 24-month time frame will require Department approval.

9.1 The Permittee shall notify the Department via email or facsimile when relocating a drilling rig to or from a well pad location where drilling operations are authorized under this permit.

9.2 In each operating report under condition 44, provide a summary of drilling operations that were covered by this permit during the reporting period, and projected operations during the next reporting period. Such summaries must indicate, for each drill rig and associated equipment operating under this permit, the location (well pad) and duration (in total consecutive months) of each drilling activity that occurred or is occurring during the reporting period.

9.3 Notify the Department per condition 43 if any drill rig and associated equipment operating under the authorization of this permit is located at an individual well pad for more than 24 consecutive months.

[18 AAC 50.335(g)(1); 50.350(g) – (i); 50.990(92), 5/3/02]

Liquid Fuel Sulfur Content Limit

10. The Permittee shall not burn any liquid fuel with a sulfur content greater than 0.25% by weight.

10.1 Monitor, record, and report according to condition 5.1.

10.2 Notify the Department per condition 43 if the fuel sulfur content limit in condition 10 is exceeded.

[18 AAC 50.335(g)(1), 1/18/97; 18 AAC 50.350(g) – (i), 5/3/02]

[3] From 18 AAC 50.990(92) "temporary construction activity" means construction that is completed in 24 months or less from the date construction begins and includes any period of inactivity during that 24-month period.

Section 7. Visible Emissions and PM Monitoring, Recordkeeping and Reporting

Liquid Fuel-Fired Fuel-Burning Equipment "Heaters and Boilers"

11. Visible Emissions Monitoring. For each rig operated, the Permittee shall observe the exhaust of the "Heaters and Boilers" for visible emissions using the Method 9 Plan under condition 11.1.

11.1 **Method 9 Plan.** For all 18-minute observations in this plan, observe exhaust, following 40 C.F.R. 60, Appendix A-4, Method 9, adopted by reference in 18 AAC 50.040(a), for 18 minutes to obtain 72 consecutive 15-second opacity observations.

a. Annual Method 9 Observations. Perform 18-minute observations at least once in a calendar year for each emission unit operating at least seven consecutive days during that calendar year at a site governed by this permit.

b. Alternate Method 9 Observation. If the 18-minute observations required by condition 11.1a are not accomplished while this emission unit is located at the site governed by this permit, the observations may be conducted at another site within the timeframe specified under condition 11.1a.

[18 AAC 50.335(j) & 50.350(g), 1/18/97; 18 AAC 50.346(c), 5/3/02]

12. Visible Emissions Recordkeeping. The Permittee shall keep records in accordance with this condition.

12.1 When conducting the Method 9 observations of condition 11.1

a. the observer shall record

(i) the name of the stationary source, emissions unit and location, stationary source type, observer's name and affiliation, and the date on the Visible Emissions Field Data Sheet in Section 14;

(ii) the time, estimated distance to the emissions location, approximate wind direction, estimated wind speed, description of the sky condition (presence and color of clouds), plume background, and operating rate (load or fuel consumption rate) on the sheet at the time opacity observations are initiated and completed;

(iii) the presence or absence of an attached or detached plume and the approximate distance from the emissions outlet to the point in the plume at which the observations are made;

(iv) opacity observations to the nearest five percent at 15-second intervals on the Visible Emissions Observation Record in Section 14; and

(v) the minimum number of observations required by the permit; each momentary observation recorded shall be deemed to represent the average opacity of emissions for a 15-second period;

b. to determine the six-minute average opacity, divide the observations recorded on the record sheet into sets of 24 consecutive observations; sets need not be consecutive in time and in no case shall two sets overlap; for each set of 24 observations, calculate the average by summing the opacity of the 24 observations and dividing this sum by 24; record the average opacity on the sheet;

c. calculate and record the highest 18-consecutive-minute average observed.

[18 AAC 50.350(h), 5/3/02]

13. Visible Emissions Reporting. The Permittee shall report visible emissions as follows:

13.1 include in each operating report under condition 44

a. copies of the observation results (i.e. opacity observations), except for the observations the Permittee has already supplied to the Department;

b. a summary to include:

(i) number of days observations were made;

(ii) highest six-minute average observed; and

(iii) dates when one or more observed six-minute averages were greater than 20 percent; and

c. a summary of any monitoring or recordkeeping required under conditions 11 and 12 that was not done.

13.2 report under condition 43:

a. the results of Method 9 observations that exceed an average 20 percent for any six-minute period; and

b. if any monitoring under condition 11 was not performed when required.

[18 AAC 50.350(i), 1/18/97 & 18 AAC 50.346(c), 5/3/02]

14. Particulate Matter Monitoring for Liquid Fuel-Fired Fuel Burning Equipment. The Permittee shall conduct emission unit tests on liquid fuel-fired "Heaters and Boilers", to determine the concentration of particulate matter (PM) in the exhaust of an emission unit in accordance with the following.

14.1 Except as provided in condition 14.4, within six months of exceeding the criteria of condition14.2, either

a. conduct a PM emission unit test according to requirements set out in Section 10; or

b. make repairs so that emissions no longer exceed the criteria of condition 14.2; to show that emissions are below those criteria, observe emissions as described in condition 11.1 under load conditions comparable to those when the criteria were exceeded.

14.2 Conduct the test according to condition 14.1 if 18 consecutive minutes of Method 9 observations result in an 18-minute average opacity greater than 20 percent.

14.3 During each one hour PM emission unit test run, observe the exhaust for 18 minutes in accordance with Method 9 and calculate the average opacity that was measured during each one-hour test run. Submit a copy of these observations with the emission unit test report.

14.4 The automatic PM emission unit test requirement in conditions 14.1 and 14.2 is waived for an emissions unit if a PM emission unit test on that unit has shown compliance with the PM standard during this permit term.

[18 AAC 50.350(g), 1/18/97 & 18 AAC 50.346(c), 5/3/02]

15. Particulate Matter Reporting for Fuel Burning Equipment. The Permittee shall report for liquid fuel-fired "Heaters and Boilers" as follows:

15.1 report under condition 43

a. the results of any PM emission unit test that exceed the PM emissions limit; or

b. if the threshold of condition 14.2 was exceeded and the Permittee did not comply with either condition14.1a or 14.1b.

15.2 in each operating report under condition 44, include

a. the dates, Rig ID and heater/boiler rating from Section 16, and results when an observed 18-minute average was greater than the threshold in condition 14.2;

b. a summary of the results of any PM testing under condition 14; and

c. copies of any visible emissions observation results (opacity observations) greater than the threshold of condition 14.2, if they were not already submitted.

[18 AAC 50.350(i), 1/18/97 & 18 AAC 50.346(c), 5/3/02]

Section 8. Insignificant Emission units

This section contains the requirements that the Permittee identified under 18 AAC 50.335(q)(2) as applicable to insignificant emission units at the stationary source. This section also specifies the testing, monitoring, recordkeeping, and reporting for insignificant emission units that the Department finds necessary to ensure compliance with the applicable requirements. Insignificant emission units are not exempted from any air quality control requirement or federally enforceable requirement.

As set out in 18 AAC 50.350(m), the shield of AS 46.14.290 does not apply to insignificant emission units.

16. The Permittee shall not cause or allow visible emissions, excluding condensed water vapor, emitted from an industrial process, fuel-burning equipment, or an incinerator to reduce visibility through the exhaust effluent by either;

a. more than 20 percent for more than three minutes in any one hour[4], or

[18 AAC 50.050(a)(1), 18 AAC 50.055(a)(1), 1/18/97 & 40 CFR 52.70, 11/18/98]

b. more than 20 percent averaged over any six consecutive minutes[5].

[18 AAC 50.050(a) & 18 AAC 50.055(a)(1), 5/3/02]

17. The Permittee shall not cause or allow particulate matter emitted from an industrial process or fuel-burning equipment to exceed 0.05 grains per cubic foot of exhaust gas corrected to standard conditions and averaged over three hours.

[18 AAC 50.055(b)(1), 1/18/97]

18. The Permittee shall not cause or allow sulfur compound emissions, expressed as SO_2, from an industrial process or fuel-burning equipment, to exceed 500 ppm averaged over three hours.

[18 AAC 50.055(c), 1/18/97]

19. Based on reasonable inquiry, the Permittee shall certify compliance with the requirements specified in conditions 16, 17, and 18 as set out in condition 45.

[18 AAC 50.350(m)(3), 6/21/98]

20. The Permittee shall comply with the requirements of condition 26.

[18 AAC 50.346(b)(1), 5/3/02]

[4] See footnote #1
[5] See footnote #2

Section 9. Generally Applicable Requirements

21. **Good Air Pollution Control Practice.** The Permittee shall do the following for each significant emission unit:

    a. Perform regular maintenance considering the manufacturer's or the operator's maintenance procedures;

    b. Keep records of any maintenance that would have a significant effect on emissions; the records may be kept in electronic format;

    c. Keep a copy of either the manufacturer's or the operator's maintenance procedures.

    [18 AAC 50.030 & 50.346(b)(2), 5/3/02 & 18 AAC 50.350(f)(2) & (3), 1/18/97]

22. **Dilution.** The Permittee shall not dilute emissions with air to comply with this permit. Monitoring shall consist of an annual certification that the Permittee does not dilute emissions to comply with this permit.

    [18 AAC 50.045(a), 1/18/97]

23. **Reasonable Precautions to Prevent Fugitive Dust.** The Permittee shall take reasonable precautions to prevent particulate matter from being emitted into the ambient air when causing or permitting bulk materials to be handled, transported, or stored, or when engaging in an industrial activity or construction project. Monitoring shall consist of an annual certification that reasonable precautions were taken.

    [18 AAC 50.346(c), 5/3/02; 18 AAC 50.045(d) & 50.350(g), 1/18/97 & 18 AAC 50.040(e), 8/15/02]

24. **Stack Injection.** The Permittee shall not release materials other than process emissions, products of combustion, or materials introduced to control pollutant emissions from a stack at an emission unit constructed or modified after November 1, 1982, unless approved in writing by the Department. Monitoring shall consist of an annual certification that the Permittee does not conduct stack injection at the stationary source.

    [18 AAC 50.055(g), 1/18/97]

25. **Open Burning.** The Permittee shall conduct any open burning at the stationary source in accordance with the requirements of 18 AAC 50.065. Monitoring shall consist of an annual certification that any open burning complied with 18 AAC 50.065.

    [18 AAC 50.040(e), 7/21/01, 18 AAC 50.065, 7/21/01, 18 AAC 50.350(d)(1), 1/18/97]

26. **Air Pollution Prohibited.** No person may permit any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property.

    [18 AAC 50.346(a)(2), 5/3/02; 18 AAC 50.110, 5/26/72; 18 AAC 50.040(e), 8/15/02]

    26.1 If emissions present a potential threat to human health or safety, the Permittee shall report any such emissions according to condition 43.

26.2 As soon as practicable after becoming aware of a complaint that is attributable to emissions from the stationary source, the Permittee shall investigate the complaint to identify emissions that the Permittee believes have caused or are causing a violation of condition 26.

26.3 The Permittee shall initiate and complete corrective action necessary to eliminate any violation identified by a complaint or investigation as soon as practicable if

a. after an investigation because of a complaint or other reason, the Permittee believes that emissions from the stationary source have caused or are causing a violation of condition 26; or

b. the Department notifies the Permittee that it has found a violation of condition 26.

26.4 The Permittee shall keep records of

a. the date, time, and nature of all emissions complaints received;

b. the name of the person or persons that complained, if known;

c. a summary of any investigation, including reasons the Permittee does or does not believe the emissions have caused a violation of condition 26; and

d. any corrective actions taken or planned for complaints attributable to emissions from the stationary source.

26.5 With each operating report under condition 44, the Permittee shall include a brief summary report which must include

a. the number of complaints received;

b. the number of times the Permittee or the Department found corrective action necessary;

c. the number of times action was taken on a complaint within 24 hours; and

d. the status of corrective actions the Permittee or Department found necessary that were not taken within 24 hours.

26.6 The Permittee shall notify the Department of a complaint that is attributable to emissions from the stationary source within 24 hours after receiving the complaint, unless the Permittee has initiated corrective action within 24 hours of receiving the complaint.

[18 AAC 50.346(a)(2) & 50.350(g) - (i), 5/3/02]

27. **Technology-Based Emission Standard.** If an unavoidable emergency, malfunction, or non-routine repair, as defined in 18 AAC 50.235, causes emissions in excess of a technology-based emission standard[6] , the Permittee shall take all reasonable steps to minimize levels of emissions that exceed the standard. Excess emissions reporting under condition 43 requires information on the steps taken to minimize emissions. The report required under condition 43 is adequate monitoring for compliance under this condition.

[18 AAC 50.235(a) & 50.350(f)(3), 1/18/97]

28. **Permit Renewal.** To renew this permit, the Permittee shall submit an application under 18 AAC 50.335 no sooner than **June 30, 2007** and no later than **June 30, 2008.**

[18 AAC 50.335(a), 1/18/97]

[6] *Technology-based emission standard* means a best available control technology standard (BACT); a lowest achievable emission rate standard (LAER); a maximum achievable control technology standard established under 40 C.F.R. 63, Subpart B, adopted by reference in 18 AAC 50.040(c); a standard adopted by reference in 18 AAC 50.040(a) or (c); and any other similar standard for which the stringency of the standard is based on determinations of what is technologically feasible, considering relevant factors. [18 AAC 50.990(91)]

Section 10. General Emission unit Testing and Monitoring Requirements

29. **Requested Emission unit Tests.** In addition to any emission unit testing explicitly required by the permit, the Permittee shall conduct emission unit testing as requested by the Department to determine compliance with applicable permit requirements.

[18 AAC 50.220(a), 1/18/97 & 18 AAC 50.345(a) & (k), 5/3/02]

30. **Operating Conditions.** Unless otherwise specified by an applicable requirement or test method, the Permittee shall conduct emission unit testing

[18 AAC 50.220(b) & 50.350(g), 1/18/97]

30.1 at a point or points that characterize the actual discharge into the ambient air; and

30.2 at the maximum rated burning or operating capacity of the emission unit or another rate determined by the Department to characterize the actual discharge into the ambient air.

31. **Reference Test Methods.** The Permittee shall use the following as reference test methods when conducting emission unit testing for compliance with this permit:

31.1 Emission unit testing for compliance with requirements adopted by reference in 18 AAC 50.040(a) must be conducted in accordance with the methods and procedures specified in 40 C.F.R. 60.

[18 AAC 50.220(c)(1)(A) & 50.350(g), 1/18/97 & 18 AAC 50.040(a), 8/15/02]
[40 C.F.R. 60, 7/1/01]

31.2 Emission unit testing for compliance with requirements adopted by reference in 18 AAC 50.040(b) must be conducted in accordance with the methods and procedures specified in 40 C.F.R. 61.

[18 AAC 50.040(b), 8/15/02; 50.220(c)(1)(B) & 50.350(g), 1/18/97]
[40 C.F.R. 61, 7/1/01]

31.3 Emission unit testing for compliance with requirements adopted by reference in 18 AAC 50.040(c) must be conducted in accordance with the emission unit test methods and procedures specified in 40 C.F.R. 63.

[18 AAC 50.040(c), 6/1/02; 18 AAC 50.220(c)(1)(C) & 50.350(g), 1/18/97]
[40 C.F.R. 63, 4/5/02]

31.4 Emission unit testing for the reduction in visibility through the exhaust effluent must be conducted in accordance with the procedures set out in Reference Method 9.

[18 AAC 50.030, 5/3/02, 18 AAC 50.220(c)(1)(D) & 50.350(g), 1/18/97]

31.5 Emission unit testing for emissions of total particulate matter, sulfur compounds, nitrogen compounds, carbon monoxide, lead, volatile organic compounds, fluorides, sulfuric acid mist, municipal waste combustor organics, metals, and acid gases must be conducted in accordance with the methods and procedures specified in 40 C.F.R. 60, Appendix A.

[18 AAC 50.040(a)(4), 8/15/02 & 18 AAC 50.220(c)(1)(E) & 50.350(g), 1/18/97]
[40 C.F.R. 60, Appendix A, 7/1/01]

31.6 Emission unit testing for emissions of PM-10 must be conducted in accordance with the procedures specified in 40 C.F.R. 51, Appendix M, Method 201.

[18 AAC 50.035(b)(2), 7/2/00; 18 AAC 50.220(c)(1)(F) & 50.350(g), 1/18/97]
[40 C.F.R. 51, Appendix M, 7/1/99]

31.7 Emission unit testing for emissions of any contaminant may be determined using an alternative method approved by the Department in accordance with 40 C.F.R. 63 Appendix A, Method 301.

[18 AAC 50.040(c)(19), 6/1/02 & 18 AAC 50.220(c)(2) & 50.350(g), 1/18/97]
[40 C.F.R. 63, Appendix A, Method 301, 4/5/02]

32. Excess Air Requirements. To determine compliance with this permit, standard exhaust gas volumes must include only the volume of gases formed from the theoretical combustion of fuel, plus the excess air volume normal for the specific emission unit type, corrected to standard conditions (dry gas at 68° F and an absolute pressure of 760 millimeters of mercury).

[18 AAC 50.220(c)(3), 18 AAC 50.350(g), 1/18/97 & 18 AAC 50.990(88), 5/3/02]

33. Test Exemption. The Permittee is not required to comply with conditions 35, 36 and 37 when the exhaust is observed for visible emissions.

[18 AAC 50.345(a), 5/3/02]

34. Test Deadline Extension. The Permittee may request an extension to a emission unit test deadline established by the Department. The Permittee may delay a emission unit test beyond the original deadline only if the extension is approved in writing by the Department's appropriate division director or designee.

[18 AAC 50.345(a) & (l), 5/3/02]

35. Test Plans. Except as provided in condition 33, before conducting any emission unit tests, the Permittee shall submit a plan to the Department. The plan must include the methods and procedures to be used for sampling, testing, and quality assurance and must specify how the emission unit will operate during the test and how the Permittee will document that operation. The Permittee shall submit a complete plan within 60 days after receiving a request under condition 29 and at least 30 days before the scheduled date of any test unless the Department agrees in writing to some other time period. Retesting may be done without resubmitting the plan.

[18 AAC 50.345(a) & (m), 5/3/02]

36. Test Notification. Except as provided in condition 33, at least 10 days before conducting a emission unit test, the Permittee shall give the Department written notice of the date and the time the emission unit test will begin.

[18 AAC 50.345(a) & (n), 5/3/02]

37. **Test Reports.** Except as provided in condition 33, within 60 days after completing a emission unit test, the Permittee shall submit two copies of the results in the format set out in the *Emission unit Test Report Outline*, adopted by reference in 18 AAC 50.030. The Permittee shall certify the results in the manner set out in condition 39. If requested in writing by the Department, the Permittee must provide preliminary results in a shorter period of time specified by the Department.

[18 AAC 50.345(a) & (o), 5/3/02]

38. **Particulate Matter Calculations.** In emission unit testing for compliance with the particulate matter standards in conditions 4 and 17, the three-hour average is determined using the average of three one-hour test runs.

[18 AAC 50.220(f) & 50.350(g), 1/18/97]

Section 11. General Recordkeeping, Reporting, and Compliance Certification Requirements

39. Certification. The Permittee shall certify all reports, compliance certifications, or other documents submitted to the Department and required under the permit by including the signature of a responsible official for the permitted stationary source following the statement: "Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete." Excess emission reports must be certified either upon submittal or with an operating report required for the same reporting period. All other reports and other documents must be certified upon submittal. When certifying a compliance certification, the official's signature must be notarized.

[18 AAC 50.205 and 50.350(b)(3) & (j), 1/18/97; and 18 AAC 50.345(a) & (j), 5/3/02]

40. Submittals. Unless otherwise directed by the Department or this permit, the Permittee shall send reports, compliance certifications, and other documents required by this permit to ADEC, Air Permits Program, 610 University Ave., Fairbanks, AK 99709-3643, ATTN: Compliance Technician. The Permittee may, upon consultation with the Compliance Technician regarding software compatibility, provide electronic copies of data reports, emission unit test reports, or other records under a cover letter certified in accordance with condition 39.

[18 AAC 50.350(i), 1/18/97]

41. Information Requests. The Permittee shall furnish to the Department, within a reasonable time, any information the Department requests in writing to determine whether cause exists to modify, revoke and reissue, or terminate the permit or to determine compliance with the permit. Upon request, the Permittee shall furnish to the Department copies of records required to be kept by the permit. The Department may require the Permittee to furnish copies of those records directly to the federal administrator.

[18 AAC 50.200 & 50.350(b)(3), 1/18/97; and 18 AAC 50.345(a) & (i) & 50.350(g) – (i), 5/3/02]

42. Recordkeeping Requirements. The Permittee shall keep all records required by this permit for at least five years after the date of collection, including:

[18 AAC 50.350(h), 5/3/02]

42.1 copies of all reports and certifications submitted pursuant to this section of the permit; and

42.2 records of all monitoring required by this permit, and information about the monitoring including:

a. calibration and maintenance records, original strip chart or computer-based recordings for continuous monitoring instrumentation;

b. sampling dates and times of sampling or measurements;

c. the operating conditions that existed at the time of sampling or measurement;

d. the date analyses were performed;

e. the location where samples were taken;

f. the company or entity that performed the sampling and analyses;

g. the analytical techniques or methods used in the analyses; and

h. the results of the analyses.

43. Excess Emissions and Permit Deviation Reports.

43.1 Except as provided in condition 26, the Permittee shall report all emissions or operations that exceed or deviate from the requirements of this permit as follows:

a. in accordance with 18 AAC 50.240(c), as soon as possible after the event commenced or is discovered, report

(i) emissions that present a potential threat to human health or safety; and

(ii) excess emissions that the Permittee believes to be unavoidable;

b. in accordance with 18 AAC 50.235(a), within two working days after the event commenced or was discovered, report an unavoidable emergency, malfunction, or nonroutine repair that causes emissions in excess of a technology based emission standard;

c. report all other excess emissions and permit deviations

(i) within 30 days of the end of the month in which the emissions or deviation occurs or is discovered, except as provided in conditions 43.1c(ii) and 43.1c(iii);

(ii) if a continuous or recurring excess emissions is not corrected within 48 hours of discovery, within 72 hours of discovery unless the Department provides written permission to report under condition 43.1c(i); and

(iii) for failure to monitor, as required in other applicable conditions of this permit.

43.2 When reporting excess emissions, the Permittee must report using either the Department's on-line form, which can be found at http://www.state.ak.us/dec/air/ap/docs/eeform.pdf, or if the Permittee prefers, the form contained in Section 17 of this permit. The Permittee must provide all information called for by the form that is used.

43.3 When reporting a permit deviation, the Permittee must report using either the Department's on-line form, which can be found at http://www.state.ak.us/dec/air/ap/docs/eeform.pdf, or if the Permittee prefers, the form contained in Section 17 of this permit. The Permittee must provide all information called for by the form.

43.4 If requested by the Department, the Permittee shall provide a more detailed written report as requested to follow up an excess emissions report.

[18 AAC 50.235(a)(2), 50.240(c), & 50.350(i), 1/18/97; and 18 AAC 50.346(a)(3), 5/3/02]

44. Operating Reports. During the life of this permit, the Permittee shall submit to the Department an original and two copies of an operating report by April 30 for the period January 1 to March 31, by July 30 for the period April 1 to June 30, by October 30 for the period July 1 to September 30, and by February 14 for the period October 1 to December 31 of the previous year.

44.1 The operating report must include all information required to be in operating reports by other conditions of this permit.

44.2 If excess emissions or permit deviations that occurred during the reporting period are not reported under condition 44.1, either

a. The Permittee shall identify

(i) the date of the deviation;

(ii) the equipment involved;

(iii) the permit condition affected;

(iv) a description of the excess emissions or permit deviation; and

(v) any corrective action or preventive measures taken and the date of such actions; or

b. When excess emissions or permit deviations have already been reported under condition 43 the Permittee may cite the date or dates of those reports.

45. Annual Compliance Certification. Each year by March 31 and for reporting periods following the effective date of this permit, the Permittee shall compile and submit to the Department one original and two copies of an annual compliance certification report as follows:

[18 AAC 50.350(j), 1/18/97]

45.1 For each permit term and condition set forth in Section 4 through Section 11, including terms and conditions for monitoring, reporting, and recordkeeping:

[18 AAC 50.350(d)(4), 6/21/98]

a. certify the compliance status over the preceding calendar year consistent with the monitoring required by this permit;

b. state whether compliance is intermittent or continuous;

c. briefly describe each method used to determine the compliance status; and

d. notarize the responsible official's signature.

[18 AAC 50.205, 1/18/97 & 50.345(a) & (j), 5/3/02]

45.2 In addition, submit a copy of the report directly to the EPA-Region 10, Office of Air Quality, M/S OAQ-107, 1200 Sixth Avenue, Seattle, WA 98101.

[18 AAC 50.350(j), 1/18/97]

Section 12. Standard Conditions Not Otherwise Included in the Permit

46. The Permittee must comply with each permit term and condition. Noncompliance with a permit term or condition constitutes a violation of AS 46.14, 18 AAC 50, and, except for those terms or conditions designated in the permit as not federally enforceable, the Clean Air Act, and is grounds for

46.1 an enforcement action;

46.2 permit termination, revocation and reissuance, or modification in accordance with AS 46.14.280; or

46.3 denial of an operating-permit renewal application.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (c), 5/3/02]

47. It is not a defense in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with a permit term or condition.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (d), 5/3/02]

48. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of the permit.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (e), 5/3/02]

49. Compliance with permit terms and conditions is considered to be compliance with those requirements that are

49.1 included and specifically identified in the permit; or

49.2 determined in writing in the permit to be inapplicable.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (b), 5/3/02]

50. The permit may be modified, reopened, revoked and reissued, or terminated for cause. A request by the Permittee for modification, revocation and reissuance, or termination or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (f), 5/3/02]

51. The permit does not convey any property rights of any sort, nor any exclusive privilege.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (g), 5/3/02]

52. The Permittee shall allow the Department or an inspector authorized by the Department, upon presentation of credentials and at reasonable times with the consent of the owner or operator to

52.1 enter upon the premises where a emission unit subject to the permit is located or where records required by the permit are kept;

52.2 have access to and copy any records required by the permit;

52.3 inspect any stationary source, equipment, practices, or operations regulated by or referenced in the permit; and

52.4 sample or monitor substances or parameters to assure compliance with the permit or other applicable requirements.

[18 AAC 50.350(b)(3), 1/18/97 & 18 AAC 50.345(a) & (h), 5/3/02]

Section 13. Permit As Shield from Inapplicable Requirements

In accordance with AS 46.14.290, and based on information supplied in the permit application, this section of the permit contains the requirements determined by the Department not to be applicable to the Transportable Drilling Rig operations authorized under this permit.

Table 3 identifies the emission units that are not subject to the specified requirements at the time of permit issuance. Some of the requirements listed below may become applicable during the permit term due to an invoking event, even though the requirement is deemed inapplicable at the time of permit issuance.

53. If any of the requirements listed in Table 3 becomes applicable during the permit term, the Permittee shall comply with such requirements on a timely basis including, but not limited to, providing appropriate notification to EPA, and applying for a construction permit and/or an operating permit revision, if necessary.

Table 3 - Permit Shields Granted.

Non-Applicable Requirements	Reason for non-applicability
Liquid Fuel-Fired Heaters, Boilers and Snow Melter(s)	
40 CFR 60 Subpart D -Standards of Performance for Fossil-Fuel-Fired Steam Generators	Heat input capacities below threshold (250 MMBtu/hr); and units not classified as Fossil-Fuel-Fired Steam Generators, as defined in subpart.
40 CFR 60 Subpart Da -Standards of Performance for Electric Utility Steam Generating Units	Heat input capacities below threshold (250 MMBtu/hr); and units not classified as Electric Utility Steam Generating Units, as defined in subpart.
40 CFR 60 Subpart Db -Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units	Heat input capacities below threshold (100 MMBtu/hr).
40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	Heat input capacities below threshold (10 MMBtu/hr).
Petroleum Liquid Storage Tanks	
40 CFR Subpart K and Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids	Design capacity of all storage tanks is less than 40,000 gallons.
Volatile Organic Liquid (Including Petroleum Liquid) Storage Tanks < 40 m^3 Capacity	
40 CFR 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)	Design capacity is <10,567 gallons.
Volatile Organic Liquid (Including Petroleum Liquid) Storage Tanks ≥ 40 m^3 Capacity	
40 CFR 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)	Design capacity <75 m^3; **or** design capacity ≥75 m^3 , but < 151 m^3 with a maximum true vapor pressure (TVP) of the stored liquid(s) less than 2.2 psia; **or** design capacity ≥151 m^3 with a maximum TVP of the stored liquid(s) less than 0.5 psia.
Volatile Organic Liquid (Including Petroleum Liquid) Storage Tanks #420,000 gallon Capacity Used For Petroleum or Condensate Stored, Processed, or Treated Prior to Custody Transfer	
40 CFR 60 Subpart K – Standards of Performance for Storage Vessels for Petroleum Liquids	Subpart K does not apply to storage vessels for petroleum or condensate stored, processed, and/or treated at a drilling rig prior to custody transfer [ref. §60.110(b)].

Non-Applicable Requirements	Reason for non-applicability
40 CFR 60 Subpart Ka – Standards of Performance for Storage Vessels for Petroleum Liquids	Storage tanks with a design capacity less than 420,000 gallons used for petroleum or condensate stored, processed, or treated prior to custody transfer are exempt from 40 CFR 60 Subpart Ka [ref. §60.110a(b)].
40 CFR 60 Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels)	Storage tanks with a design capacity less than or equal to 420,000 gallons used for petroleum or condensate stored, processed, or treated prior to custody transfer are exempt from 40 CFR 60 Subpart Kb [ref. §60.110b(d)(4)].
Stationary Source-Wide	
18 AAC 50.201 – Ambient Air Quality Investigation	This requirement is not applicable until such time as the Department requests an ambient air quality investigation.
Air Quality Control Permit Nos. 9573-AA016, 9573-AA017, 9573-AA018, 9573-AA019, and 9573-AA020.	Superseded and rescinded upon issuance of this permit, per 18 AAC 50.340(i).
40 CFR 61 – National Emission Standards for Hazardous Air Pollutants	Drilling rigs do not operate emission units affected by NESHAPs under Part 61.
40 CFR 61 Subpart A - General Provisions	Requirements only apply to emission units subject to any provision of 40 CFR 61.
40 CFR 61 Subpart M – National Emission Standards for Asbestos	Stationary source does not operate any emission unit, or engage in any activity specified by §§61.142 through 61.151, §61.154, and §61.155.
40 CFR 61 Subpart V – National Emission Standard for Equipment Leaks (Fugitive Emissions Emission units)	Stationary source has no process components in volatile hazardous air pollutant (VHAP) service, as defined by subpart (≥10 percent VHAP by weight).
40 CFR 63 – National Emission Standards for Hazardous Air Pollutants for Emission unit Categories	Drill rigs are not major emission units of HAPs, as defined in 40 CFR §63.2.
40 CFR 64 – Compliance Assurance Monitoring	No pollutant-specific emission unit uses a control device to achieve compliance with any emission limitation or standard.
40 CFR 68 - Accidental Release Prevention Requirements: Risk Management Programs [§ 112(r)]	"Naturally occurring hydrocarbon mixtures" (crude oil, condensate, natural gas and produced water), prior to entry into a petroleum refining process unit (NAICS code 32411) or a natural gas processing plant (NAICS code 211112) are exempt from the threshold determination. (See Final Rule exempting from threshold determination regulated flammable substances in naturally occurring hydrocarbon mixtures prior to initial processing, 63 FR 640 [January 6, 1998]). Less than 10,000 lbs. of other mixtures containing regulated flammable substances that meet the criteria for an NFPA rating of 4 for flammability are stored at the stationary source. Therefore, the drilling rigs do not process or store regulated flammable or toxic substances in excess of threshold quantities.
40 CFR 82 - Protection of Stratospheric Ozone	Drilling rigs do not handle Class I or Group I or II substances or products (including Halon and Halon blends).

[18 AAC 50.350(l), 1/18/97]

Section 14. Visible Emissions Forms

Visible Emissions Field Data Sheet

Certified Observer: _____

Company & Stationary source: _____

Location: _____

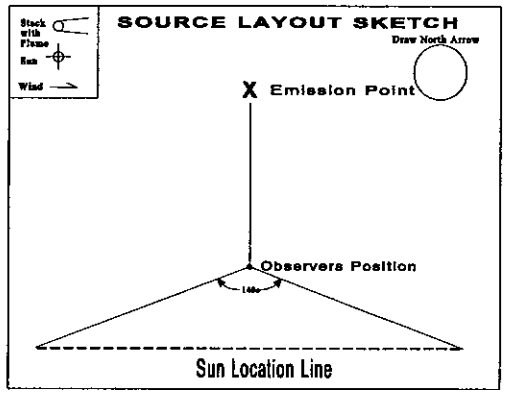
Test No.: _____ Date: _____

Emission unit: _____

Operating Rate: _____

_____

_____



Clock Time	Initial				Final
Observer location Distance to discharge					
Direction from discharge					
Height of observer point					
Background description					
Weather conditions Wind Direction					
Wind speed					
Ambient Temperature					
Relative humidity					
Sky conditions: (clear, overcast, % clouds, etc.)					
Plume description: Color					
Distance visible					
Water droplet plume? (Attached or detached?)					
Other information					

Visible Emissions Observation Record

Page ___ of ___

Company & Stationary source_____ Certified Observer_____

Test Number _____ Clock time_____

Date:		Visibility reduction every 15 Seconds (Opacity)				Steam Plume (check if applicable)		Comments
Hr	Min	0	15	30	45	Attached	Detached	

Additional information:

_____ _____

Observer Signature and Date Certified By and Date

Data Reduction:

Duration of Observation Period (minutes) _____ Duration Required by Permit (minutes)_____

Number of Observations _____ Highest Six –Minute Average Opacity (%)_____

Number of Observations exceeding 20 % _____

In compliance with three-minute aggregate opacity limit? (Yes or No) _____

In compliance with six-minute opacity limit? (Yes or No) _____

Average Opacity Summary

Set Number	Time Start—End	Opacity	
		Sum	Average

Section 15. SO_2 Material Balance Calculation

If a fuel shipment contains more than 0.75 percent sulfur by weight, calculate the three-hour exhaust concentration of SO_2 using the following equations:

$A = 31,200 \times [wt\%S_{fuel}] = 31,200 \times$ _____ = _____

$B = 0.148 \times [wt\%S_{fuel}] = 0.148 \times$ _____ = _____

$C = 0.396 \times [wt\%C_{fuel}] = 0.396 \times$ _____ = _____

$D = 0.933 \times [wt\%H_{fuel}] = 0.933 \times$ _____ = _____

$E = B + C + D =$ _____ + _____ + _____ = _____

$F = 20.9 - [vol\%_{dry}O_{2,\ exhaust}] = 20.9 -$ _____ = _____

$G = [vol\%_{dry}O_{2,\ exhaust}] \div F =$ _____ ÷ _____ = _____

$H = 1 + G = 1 +$ _____ = _____

$I = E \times H =$ _____ x _____ = _____

SO_2 concentration = $A \div I =$ _____ ÷ _____ = _____ ppm

The $wt\%S_{fuel}$, $wt\%C_{fuel}$, and $wt\%H_{fuel}$ are equal to the weight percents of sulfur, carbon, and hydrogen in the fuel. These percentages should total 100%.

The fuel weight percent (wt%) of sulfur is obtained pursuant to condition 5.1. The fuel weight percents of carbon and hydrogen are obtained from the fuel refiner.

The volume percent of oxygen in the exhaust ($vol\%_{dry}O_{2,\ exhaust}$) is obtained from oxygen meters, manufacturer's data, or from the most recent analysis under 40 C.F.R. 60, Appendix A-2, Method 3, adopted by reference in 18 AAC 50.040(a), at the same engine load used in the calculation.

Enter all of the data in percentages without dividing the percentages by 100. For example, if $\mathbf{wt\%S_{fuel}}$ = 1.0%, then enter 1.0 into the equations, not 0.01, and if $\mathbf{vol\%_{dry}O_{2,\ exhaust}}$ = 3.00%, then enter 3.00, not 0.03.

[18 AAC 50.346(c), 5/3/02]
[18 AAC 50.350(g), 1/18/97, 18 AAC 50.346(c), 5/3/02]

Section 16. Approved Drilling Rigs

Equipment Type	Drill Rig								
	Doyon 9			Doyon 14					
	Equipment	Rating	Units	Equipment	Rating	Units			
Engines	Cat D398	912	bhp	Cat D399	1212	bhp			
	Cat D398	912	bhp	Cat D399	1212	bhp			
	Cat D399	1212	bhp	Cat D399	1212	bhp			
	Cat D398	912	bhp	Cat D966	225	bhp			
	Cat D398	912	bhp	GMC Lincoln	75	bhp			
	Cat D3406	270	bhp	Wauk VRD 3304	95	bhp			
	Cat D3406	305	bhp	Cat D379	612	bhp			
	Wauk VRD-232U	100	bhp	Cat D379	612	bhp			
	Wauk VRD-232U	100	bhp						
	Cat D379B	612	bhp						
	Cat D379B	612	bhp						
	Lister BS649	16	bhp						
Boilers and Heaters	Boiler	100	hp	Boiler	100	hp			
	Boiler	100	hp	Boiler	100	hp			
	Heater	4	MMBtu/hr	Heater	100	hp			
	Heater	4	MMBtu/hr						

Equipment Type	Drill Rig								
	Doyon 16			Doyon 19			Doyon 141		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat D398	825	bhp	Cat D398TA	700	kW	Cat D399	1215	bhp
	Cat D398	825	bhp	Cat D399TA	976	kW	Cat D399	1215	bhp
	Cat D398	825	bhp	Cat D398TA	700	kW	Cat D399	1215	bhp
	Cat D3406	350	bhp	Cat D398TA	700	kW	Cat D379	600	bhp
	Cat D3406	350	bhp	Cat D399TA	976	kW	Cat D379	600	bhp
	Lister ST3A	40	bhp	Cat D398TA	700	kW	Cat D353	435	bhp
				Cat 3176	180	kW	Lister	80	bhp
				Cat 3176	180	kW	Lister	40	bhp
							Lister	40	bhp
							Lister	40	bhp
							Lister	80	bhp
							Deutz F8L912	44	bhp
Boilers and Heaters	Boiler	100	hp	Boiler	100	hp	Boiler	100	hp
	Boiler	100	hp	Boiler	100	hp	Boiler	100	hp
	Heater	4	MMBtu/hr	Heater	4.2	MMBtu/hr	Heater	3.5	MMBtu/hr
				Heater	3.5	MMBtu/hr	Heater	4.2	MMBtu/hr
				Heater	4	MMBtu/hr	Heater	0.6	MMBtu/hr

Approved Drill Rigs (Continued)

Equipment Type	Drill Rig								
	Nabors 2ES			Nabors 3E			Nabors 4ES		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat D398	912	bhp	Cat D399	1050	kW	Cat 3412	831	bhp
	Cat D398	912	bhp	Cat D399	1050	kW	Cat 3412	831	bhp
	Cat D399	912	bhp	Cat D399	1050	kW	Cat 3412	831	bhp
	Cat D3304	135	bhp	Cat D399	1050	kW	Cat 3306	208	bhp
	Cat D353	314	bhp	Cat D353	300	kW	Deere 245	56	bhp
				Cat D353	300	kW	Cummins 130	84	bhp
				Cat D3304	90	kW	Cat 3304	121	bhp
				Cat D3304	90	kW	Perkins 330	84	bhp
							Detroit 2250015	60	bhp
Boilers and Heaters	Boiler	150	hp	Boiler	100	hp	Boiler	24	gph
	Boiler	150	hp	Boiler	100	hp	Boiler	24	gph
	Heater	2.5	MMBtu/hr	Heater	3.5	MMBtu/hr	Heater	30	gph
	Heater	0.23	MMBtu/hr	Heater	3.5	MMBtu/hr	Heater	30	gph
	Heater	0.23	MMBtu/hr	Heater	14.5	gph	Heater	18	gph
							Heater	1.65	gph
							Heater	1.65	gph

Equipment Type	Drill Rig								
	Nabors 14E (Pool 4)			Nabors 17E (Pool 7)			Nabors 18E		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat D398	600	kW	Cat D398TA	700	kW	Cat D398	800	kW
	Cat D398	600	kW	Cat D399TA	700	kW	Cat D398	800	kW
	Cat D398	600	kW	Cat D398TA	700	kW	Cat D398	800	kW
	Cat D398	600	kW	Cat D398TA	700	kW	Cat D398	800	kW
	Cat D398	600	kW	Cat D399TA	700	kW	Cummins NTA 855 GS	260	kW
	Cat D353	300	kW	Cat D3304PC	90	kW			
	Cat D353	300		Cat 379PC	600	bhp	Cummins 400F0C44FD	100	kW
				Cat 3406DI	210	kW			
				Cat D353E	250	kW	Cat D379	600	kW
				Det 1063700	unknown		Cat D379	600	kW
				Deere 4276TF001	50	kW	Det 35GD-45	30	kW
				Cat D3304	90	kW	Det 35GD-45	30	kW
				Lister ST2A	8	kW			
				Cat D3304	90	kW			
Boilers and Heaters	Boiler	100	hp	Boiler			Boiler	7.07	MMBtu/hr
	Boiler	100	hp	Boiler			Boiler	6.35	MMBtu/hr
	Heater	3.5	MMBtu/hr	Heater	3.5	MMBtu/hr	Heater	4.2	MMBtu/hr
	Heater	3.5	MMBtu/hr	Heater	3.5	MMBtu/hr	Heater	2	MMBtu/hr
				Heater	3.5	MMBtu/hr	Heater	0.185	MMBtu/hr
				Heater	2.4	MMBtu/hr	Heater	0.180	MMBtu/hr
				Heater	1.5	MMBtu/hr			
				(5) Heaters	0.23	MMBtu/hr each			

Approved Drill Rigs (Continued)

Equipment Type	Drill Rig								
	Nabors 19E			Nabors 22E			Nabors 27E		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Unknown	1350	bhp	Cat D399TA	1000	bhp	Cat D399TA	1000	bhp
	Unknown	1350	bhp	Cat D399TA	1000	bhp	Cat D399TA	1000	bhp
	Unknown	1350	bhp	Cat D399TA	1000	bhp	Cat D399TA	1000	bhp
	Unknown	252	bhp	Cat D399TA	1000	bhp	Cat D399TA	1000	bhp
	Unknown	120	bhp	Cat D3304	135	bhp	Cat D3304	135	bhp
				Cat D3306TA	200	bhp	Cat D3306TA	200	bhp
				Cat D3304	97	bhp	Cat D3304	135	bhp
				Det 353	40	bhp	Wauk VRD330	79	bhp
				Wauk VRD330	79	bhp	Wauk VRD31	61	bhp
				Cat D3406	449	bhp	Cat D3304	200	bhp
				Cat D3406	449	bhp	Perkins JA306	102	bhp
				Perkins JA306	102	bhp			
Boilers and Heaters	Boiler	4.5	MMBtu/hr	Boiler	30	gph	Boiler	30	gph
	Boiler	4.5	MMBtu/hr	Boiler	45	gph	Boiler	45	gph
	Heater	0.42	MMBtu/hr	Heater	30	gph	Heater	30	gph
	Heater	0.42	MMBtu/hr	Heater	18	gph	Heater	18	gph
	Heater	2.5	MMBtu/hr	Heater	1.25	gph	Heater	3	gph
				Heater	1.65	gph	Heater	3	gph

Equipment Type	Drill Rig								
	Nabors 28E			Nabors 245 (Parker 245)			Nabors 429 (Pool 8)		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat D398	800	kW	Cat D399	1125	hp	Cat D399	1050	kW
	Cat D399	1050	kW	Cat D399	1125	hp	Cat D399	1050	kW
	Cat D399	1050	kW	Cat D399	1125	hp	Cat D399	1050	kW
	Cat D398	800	kW	Cat D399	1125	hp	Cat D399	1050	kW
	Cat D3412	620	kW				Cat D379	350	kW
	Cat D3412	620	kW						
	Cat D3406DI	300	kW						
	Cat D3406DI	300	kW						
	Cat D3304B DI	60	kW						
Boilers and Heaters	Boiler	150	hp	Unknown			Boiler	100	hp
	Boiler	150	hp				Boiler	100	hp
	Heater	4.2	MMBtu/hr				Heater	2.4	MMBtu/hr

Approved Drill Rigs (Continued)

Equipment Type	Drill Rig								
	Nordic 1			Nordic 2			Nordic 3		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat 3412 DITA	1,011	Bhp	Cat 3412	700	bhp	Cat 3512	1450	bhp
	Cat 3412 DITA	1,011	Bhp	Cat 3412	700	bhp	Cat 3512	1450	bhp
	Cat 3406	400	Bhp	Cat 3412	700	bhp	Cat 3512	1450	bhp
							Cat 3406	600	bhp
							Cat 3406	600	bhp
Boilers and Heaters	Boiler	60	Hp	Boiler	80	hp	Boiler	80	hp
	Boiler	60	Hp	Boiler	80	hp	Boiler	80	hp
	Heater	4.4	MMBtu/hr	Heater	4.5	MMBtu/hr	Heater	4.2	MMBtu/hr

Equipment Type	Drill Rig								
	Nabors 7ES			Nabors 9ES			Nabors 3S		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat 3512B	1477	Bhp	Cat 3512B	1477	bhp	Cat 3408	475	Bhp
	Cat 3512B	1477	Bhp	Cat 3512B	1477	bhp	Cat 3408	475	Bhp
							Cat 3408B	365	kW
	Cat 3412	831	Bhp	Cat 3412	831	bhp	Cat 3408B	365	kW
							Cat 3304	125	kW
Boilers and Heaters	Boiler	150	Hp	Boiler	150	hp	Boiler	100	Hp
	Boiler	150	Hp	Boiler	150	hp	Boiler	100	Hp
	Heater	2.5	MMBtu/hr	Heater	2.5	MMBtu/hr	Heater	1.7	MMBtu/hr
	Heater	0.23	MMBtu/hr	Heater	0.23	MMBtu/hr			
	Heater	0.23	MMBtu/hr	Heater	0.23	MMBtu/hr			

Approved Drill Rigs (Continued)

Equipment Type	Drill Rig								
	Nabors 16E			Doyon 15			Doyon Arctic Fox		
	Equipment	Rating	Units	Equipment	Rating	Units	Equipment	Rating	Units
Engines	Cat 398	900	Bhp	Cat 3516	2300	Bhp	Cat 3412	625	Bhp
	Cat 398	900	Bhp	Cat 3516	2300	Bhp	Cat 3412	625	Bhp
	Cat 398	900	Bhp	Cat 3516	2300	Bhp	Cat 3412	625	Bhp
	Cat 398	900	Bhp	Cat D399	1140	Bhp	Detroit 60	685	Bhp
	Cat 398	900	Bhp	Cat 3404	75	Bhp	Detroit 60	685	Bhp
	Cat 3304	125	kW				Detroit 14L60	600	Bhp
	Cat 3304	125	kW						
	Cat 3304	125	kW						
Boilers and Heaters	Boiler	100	Hp	Boiler	100	Hp	Boiler	100	Hp
	Boiler	100	Hp	Boiler	100	Hp	Boiler	100	Hp
	Boiler	100	Hp	Heater	4.3	MMBtu/hr	Heater	2.5	MMBtu/hr
	Heater	1.7	MMBtu/hr	Heater	4.3	MMBtu/hr			
	Heater	1.7	MMBtu/hr						

Use of an alternative drilling rig will require a permit revision in accordance with 18 AAC 50.370. Requests for the use of an alternative drill rig will qualify under 18 AAC 50.370(a)(5) provided the alternative drilling rig will operate according to the fuel use and fuel sulfur restrictions contained in Section 5 and Section 6 of this permit.

Section 17. ADEC Notification Form

Fax this form to: (907) 451-2187 Telephone: (907) 451-5173

BP Exploration (Alaska) Inc.
Company Name

Transportable Drilling Rigs
Stationary Source Name

Reason for notification:

❑ Excess Emissions
If you checked this box
Fill out section 1

❑ Other Deviation from Permit Condition
If you checked this box
fill out section 2

When did you discover the Excess Emissions or Other Deviation:
Date:__/__/__ Time:__:__

Section 1. Excess Emissions

(a) Event Information (Use 24-hour clock):

	START Time: (hr:min):	**END** Time:	**Duration**
Date: _____	_____:_____	_____:_____	_____:_____
Date: _____	_____:_____	_____:_____	_____:_____
		Total:	_____:_____

(b) Cause of Event (Check all that apply):

❑ START UP ❑ UPSET CONDITION ❑ CONTROL EQUIPMENT
❑ SHUT DOWN ❑ SCHEDULED MAINTENANCE ❑ OTHER _____

Attach a detailed description of what happened, including the parameters or operating conditions exceeded.

(c) Emission units Involved:

Identify each emission unit involved in the event, using the same identification number and name as in the permit. List any control device or monitoring system affected by the event. Attach additional sheets as necessary.

Emission Unit ID No.	Control Device	Emission unit Name	Description
_____	_____	_____	_____
_____	_____	_____	_____

(d) Emission Limit Potentially Exceeded

Identify each emission standard potentially exceeded during the event. Attach a list of ALL known or suspected injuries or health impacts. Identify what observation or data prompted this report. Attach additional sheets as necessary.

Permit Condition	Limit	Emissions Observed
_____	_____	_____
_____	_____	_____

(e) Excess Emission Reduction:

Attach a description of the measures taken to minimize and/or control emissions during the event.

(f) Corrective Actions:

Attach a description of corrective actions taken to restore the system to normal operation and to minimize or eliminate chances of a recurrence.

(g) Unavoidable Emissions:

Do you intend to assert that these excess emissions were unavoidable?

❑ YES ❑ NO

Do you intend to assert the affirmative defense of 18 AAC 50.235?

❑ YES ❑ NO

Section 2. Other Permit Deviations

(a) Emission units Involved:

Identify each emission unit involved in the event, using the same identification number and name as in the permit. List any control device or monitoring system affected by the event. Attach additional sheets as necessary.

Emission unit ID No.	Control Device	Emission unit Name	Description

(b) Permit Condition Deviation:

Identify each permit condition deviation or potential deviation. Attach additional sheets as necessary.

Permit Condition	Potential Deviation

(c) Corrective Actions:

Attach a description of actions taken to correct the deviation or potential deviation and to prevent recurrence.

Based on information and belief formed after reasonable inquiry, I certify that the statements and information in and attached to this document are true, accurate, and complete.

Printed Name: Signature: Date:

Alaska Department of Environmental Conservation

Air Permits Program

November 17, 2003

BP Exploration (Alaska) Inc.

Transportable Drilling Rigs

STATEMENT OF BASIS

of the terms and conditions for

Permit No. AQ0455TVP01

Prepared by Robert Dolan

AQ0455TVP01 Revision 2

January 14, 2008

Prepared by Shonda Oderkirk

INTRODUCTION

This document sets forth the statement of basis for the terms and conditions of Operating Permit No. AQ0455TVP01.

The operator may lease various drilling rigs, as available, over the lifetime of this permit. This permit is based on protecting ambient air quality standards during drilling and associated operations at well pads governed by a separate stationary source-wide operating permit. Worst-case modeling was used as the basis for determining emission levels for this permit. The drilling rigs are owned by contractors, but the stationary sources are operated by BP Exploration (Alaska) Inc., and BP Exploration (Alaska) Inc. is the Permittee for the operating permit for the Transportable Drilling Rigs.

STATIONARY SOURCE IDENTIFICATION

Section 1 of Operating Permit No. AQ0455TVP01 contains information on the stationary source as provided in the Title V permit application.

The SIC code for these stationary sources is 1311 Crude Petroleum and Natural Gas Production. The NAICS code of the stationary sources is 211111.

The Transportable Drilling Rigs include equipment used in drilling, well workovers and associated or supporting operations, including power generation, camp facilities, heating and lighting.

EMISSION UNIT INVENTORY AND DESCRIPTION

As provided in the application, the "worst case" drilling rig for modeling purposes operates five drilling engines, two rig electric generator engines, two camp electric generator engines, and ten light generator engines (light plants). The modeled rig also operates two rig boilers, three rig heaters, and a camp snow melter. The modeled inventory did not include a test heater, an incinerator, and a well test flare, since they have been removed from the permitted emission unit inventory of Operating Permit No. AQ0455TVP01. This equipment set was modeled as a worst-case scenario for impacts on ambient air quality standards. Other rigs may be substituted for the modeled rig at specific drill sites during the term of this permit.

The approved drilling rigs with emission unit group ratings that do not exceed the allowed "worst case" inventory group ratings are listed in Section 16 of the permit. The permittee submitted a corrected ambient impact demonstration December 2006, as presented in the permit history section below.

AMBIENT AIR QUALITY MODELING

The original five operating permits for the exploratory gas drilling program, permit nos. 9573-AA016 through -AA020, were issued in 1995 and 1996. As a requirement for obtaining these permits, air quality modeling was performed to demonstrate compliance with state regulations concerning human health, enjoyment of life and property, and plants and wildlife.

EMISSIONS

A summary of the potential to emit (PTE)[7] and assessable PTE as indicated in the previous permits from the Transportable Drilling Rigs is shown in the table below.

Table A - Emissions Summary, in Tons Per Year (TPY) per Rig

Pollutant	NO_X	CO	PM-10	SO_2	VOC	Total
PTE (all emission units)	198.1	50.3	8.1	20.8	7.5	285
PTE (nonroad engines excluded)	12.5	3.1	1.25	20.8	0.21	38
Assessable PTE (per well pad)	198.1	50.3	--	20.8	--	269

The assessable PTE listed under condition 1.1 is the sum of the emissions of each individual regulated air contaminant for which the stationary source has the potential to emit quantities greater than 10 TPY. The emissions listed in Table A are estimates that are for informational use only. The listing of the emissions does not create an enforceable limit to the stationary source.

The assessable PTE is limited by fuel sulfur content limit contained in condition 10, the annual fuel usage limit contained in condition 6, and the rig count limit contained in condition 8. Reasonable assumptions were made to calculate the emissions of up to twelve drill rigs operating concurrently per year.

The assessable PTE for fee purposes does not match the emissions used to determine the facility operating permit classification ("PTE nonroad engines excluded") because emissions from the nonroad engines at the rig facility are not considered when determining operating permit classifications, per 18 AAC 50.100.

Each rig stationary source is an area emission unit (non-major emission unit) of HAPs. The potential HAP emissions calculated by BPXA using AP-42 emission factors and applying enforceable limitations on annual fuel consumption is below the 18 AAC 50.300(f) trigger of 10/25 TPY.

[7] *Potential to Emit or PTE* means the maximum quantity of a release of an air contaminant, considering a stationary source's physical or operational design, based on continual operation of all emission units within the stationary source for 24 hours a day, 365 days a year, reduced by the effect of pollution control equipment and approved state or federal limitations on the capacity of the stationary source's emission units or the stationary source to emit an air contaminant, including limitations such as restrictions on hours or rates of operation and type or amount of material combusted, stored, or processed as defined in AS 46.14.990(21), effective 1/18/97.

BASIS FOR REQUIRING AN OPERATING PERMIT

Section 2 of Operating Permit No. AQ0455TVP01 lists the regulatory classifications of the Transportable Drilling Rigs.

The Transportable Drilling Rigs each require an operating permit under 18 AAC 50.325(b)(1) because they will operate at sites governed by a separate stationary source-specific operating permit for a stationary source that has the potential to emit 100 tpy or more of a regulated air contaminant.

Alaska regulations require operating permit applications to include identification of "regulated emission units." As applied to the Transportable Drilling Rigs, the state regulations require a description of:

⇒ Each emission unit regulated by a standard in 18 AAC 50.055, Industrial Processes and Fuel Burning Equipment, under18 AAC 50.335(e)(4)(C);

⇒ Emission units subject to requirements in an existing Department permit 18 AAC 50.335(e)(5).

The emission units at Transportable Drilling Rigs classified as "regulated emission units" according to the above Department regulations are listed in Table 1 of Operating Permit No. AQ0455TVP01.

CURRENT AIR QUALITY PERMITS

Previous Air Quality Permit to Operate

The most recent permits to operate issued for the Transportable Drilling Rigs are permits-to-operate numbers 9573-AA016, -AA017, -AA018, -AA019, and -AA020, which are identical in terms and conditions. These permits-to-operate include all construction authorizations issued through November 29, 1996, since they were issued before January 18, 1997. All stationary source-specific requirements established in each respective previous permit are included in the new operating permit as described in Table B.

Construction Permits

No construction permits have been issued for the rig stationary sources since permit-to-operate nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020 were issued.

Title V Operating Permit Application History

The owner or operator submitted separate applications for the five drilling rig stationary sources in November, 1998. BPXA withdrew all but one application via a letter dated July 15, 2003 in favor of consolidating the identical terms and conditions under the five permits into a single Title V operating permit.

Revision 1, effective January 1, 2004, authorized emission from up to 12 drilling operations conducted at aggregated well pads authorized by this permit. In addition, two drill rigs were added to Section 16, bringing the total to 22 approved drill rigs.

Revision 2 incorporated two Administrative Amendments and one Minor Permit Modification as follows:

1. BPXA submitted on March 10, 2006 an application for an administrative amendment, requesting that four drill rigs be added to the approved drill rigs list contained in Section 16. This request is consistent with 40 CFR 71.7(e) *Permit Modifications* instead of 40 CFR 71.7(d) *Administrative Permit Amendments*. Specifically, the request is consistent with 40 CFR 71.7(e)(1) Minor Permit Modifications, incorporated by reference within 18 AAC 50.040(j), according to the following rationale:

    a. As stated in Condition 8, up to twelve drilling rigs may operate concurrently at well pads where drilling is authorized by this permit. The twelve drilling rigs will be drawn from the pool of rigs in Section 16 of permit AQ0455TVP01.

    b. The addition of the four rigs meet the test criteria defining a minor permit modification in accordance with 40 CFR 71.7(e)(1) as follows:

        i. The update of Section 16 with the new four drill rigs does not violate any permit term or condition;

        ii. The change does not significantly alter a monitoring, record keeping or reporting requirement, so the update of Section 16 does not constitute a significant modification under 40 CFR 71.7(e)(3);

        iii. The change does not violate the prohibitions under 40 CFR 71.7(e)(1)(i)(3-6).

    c. The new configuration will potentially emit less than the worst case scenario for the dispersion modeling reviewed and approved in a memo dated May 19, 2004. See attached Memo from Alan Schuler P.E. to Robert Dolan

    Therefore, the Department approves that the new emission units be added to the list contained in Section16 of the permit, and the addition of drilling rigs Nabors 16E, Nabors 3S, Doyon 15 and Doyon Arctic Fox are reflected in Section 16.

2. BPXA requested on November 16, 2006 an application for a minor permit modification, to lower the rolling 12-month fuel limit to 1,250,000 gallons and to revise the Statement of Basis Table A accordingly.

    a. BPXA discovered that the ambient analysis submitted previously for Air Quality Control Operating Permit AQ0455TVP01, Revision 1 and Air Quality Control Minor Permit AQ0977MSS01 contained incorrect emission rates.

    b. The Department's February 12, 2007 Memo from Patrick Dunn to the File, states that "BPXA corrected these emission rates in their current ambient analysis submitted with their November 16, 2006 application to revise Air Quality Control

Minor Permit AQ0977MSS01. This revised modeling analysis shows that the aggregate rolling twelve month fuel limits defined in Air Quality Control Operating Permit AQ0455TVP01, Revision 1 and Air Quality Control Minor Permit AQ0977MSS01 should be reduced from 1,350,000 gallons to 1,250,000 gallons." See memo attached at end of this Statement of Basis.

c. Conclusions of the memo are:
   i. "The NO_2, SO_2, PM-10 and CO emissions associated with operating the stationary source within the revised operating limit will not cause or contribute to a violation of the AAAQS provided in 18 AAC 50.010; and
   ii. BPXA conducted the analysis in a manner consistent with EPA's *Guideline on Air Quality Models*."

d. Consistent with the modeling memorandum conclusion, staff changed the permit drill rig twelve month rolling total fuel cap to 1,250,000 gallons per pad and modified the Statement of Basis Table A.

3. On December 18, 2006 BPXA submitted a Minor Permit Modification application, to replace two diesel engines and one heater in drill rig Nordic1. This request is consistent with 40 CFR 71.7(e)(1) incorporated by reference within 18 AAC 50.040(j) for the following reasons:

   a. The drill rig engines are non-road engines and have no emission unit-specific limits. The new engines potential emissions are capped under the revised rig-wide fuel consumption limit;

   b. The replacement of the engines and the heater meet the test criteria defining a minor permit modification as listed in 40 CFR 71.7(e)(1) as follows:

      i. The replacement of the two diesel engines and heater do not violate any permit term or condition;

      ii. The change does not significantly alter a monitoring, record keeping or reporting requirement, so the update of Section 16 does not constitute a significant modification under 40 CFR 71.7(e)(3);

      iii. The change does not violate the prohibitions under 40 CFR 71.7(e)(1)(i)(3-6).

   c. The new configuration will potentially emit less than the worst case scenario for the dispersion modeling.

   d. The changes to the inventory are reflected in Section 16.

Through Revision 2, the total number of approved drill rigs is 26. However, the number of drilling rigs that BPXA can operate simultaneously remains unchanged.

COMPLIANCE HISTORY

Review of the permit files for the drilling rig stationary sources, which includes the past inspection reports, indicates the stationary sources are generally operating in compliance with their operating permits.

STATIONARY SOURCE-SPECIFIC REQUIREMENTS CARRIED FORWARD

State of Alaska regulations in 18 AAC 50.350(d)(1)(D) require that an operating permit include each stationary source-specific requirement established in a prior operating permit. Table B below lists the permit condition that established a requirement in Operating Permit Nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020 and the new condition in Operating/Construction Permit No. AQ0455TVP01 that carries the old requirement into the new permit.

Table B - Comparison of Pre-January 18, 1997 Permit Nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020 Conditions to Operating/Construction Permit No. AQ0455TVP01 Conditions[8]

Permit Nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020 Condition Number	Description of Requirement	Permit No. AQ0455TVP01 Condition Number	How condition was revised
2	Permittee shall comply with the most stringent of applicable emission standards and specifications set out in....and Exhibit B	3, 4, and 5	The Alaska SIP limits have been carried forward with amendments as listed in 18 AAC 50 dated 5/3/02. The equipment operating hour limitations have been replaced by fuel use limitations based on amended permit application submitted March 2004.
5 through 8 and Exhibit B(I)	Operating limits for permitted equipment.	None	The equipment operating hour limitations have been replaced by fuel use limitations based on amended permit application submitted March 2004.
9	Liquid fuel sulfur limit	10	The sulfur limit has been reduced from 0.30% to 0.25% based on amended permit application submitted March 2004.

[8] This table does not include all standard and general conditions

Permit Nos. 9573-AA016, -AA017, -AA018, -AA019, and -AA020 Condition Number	Description of Requirement	Permit No. AQ0455TVP01 Condition Number	How condition was revised
10	Startup and relocation notification	9	Relocation notification is now by email or fax and a summary report is submitted quarterly with operating report based on amended permit application submitted March 2004.
15, 16, and Exhibit C	Process and fuel sulfur monitoring	5.1 and 6.1	No change, except requirements related to the flaring of formation gas have been removed since this permit does not include use of a flare by the allowed rigs.
20 and Exhibit D	Submit quarterly operating reports	44	No change
21	Permittee shall maintain, records....for not less than one year, and....accessible to the Department for not less than three years.	42	Record retention is now five years per regulation. Standard condition.
Exhibit D, item 4	Report the high, low, mean, and standard deviation of the liquid fuel sulfur content yearly	None	This information is no longer required by the Department.

STATEMENT OF BASIS FOR THE PERMIT CONDITIONS

The state and federal regulations for each condition are cited in Operating/Construction Permit No. AQ0455TVP01.

Conditions 1 and 2, Emission Fees

Applicability: The regulations require all permits to include due dates for the payment of fees and any method the Permittee may use to re-compute assessable emissions.

Factual Basis: These standard conditions require the Permittee to pay fees in accordance with the Department's billing regulations. The billing regulations set the due dates for payment of fees based on the billing date.

The default assessable emissions are emissions of each air contaminant authorized by the permit (AS 46.14.250(h)(1)(A)). Air contaminant means any regulated air contaminant and

any hazardous air contaminant. Therefore, assessable emissions under AS 46.14.250(h)(1)(A) means the **potential** to emit any air contaminant identified in the permit, including those not specifically limited by the permit. For example, hydrogen chloride (HCl) emissions from an incinerator are assessable emissions because they are a hazardous air contaminant, even if there is currently no emission limit on HCl for that class of incinerator.

The conditions also describe how the Permittee may calculate **actual** annual assessable emissions based on previous actual annual emissions. According to AS 46.14.250(h)(1)(B), assessable emissions are based on each air contaminant. Therefore, fees based on actual emissions must also be paid on any contaminant emitted whether or not the permit contains any limitation of that contaminant.

This standard condition specifies that, unless otherwise approved by the Department, calculations of assessable emission based on actual emissions use the most recent previous calendar year's emissions. Since each current year's assessable emission are based on the previous year, the Department will not give refunds or make additional billings at the end of the current year if the estimated emissions and current year actual emissions do not match. The Permittee will normally pay for actual emissions - just with a one-year time lag.

Projected actual emissions may differ from the previous year's actual emissions if there is a change at the stationary source, such as changes in equipment or an emission rate from existing equipment.

If the Permittee does not choose to annually calculate assessable emissions, emissions fees will be based on "potential to emit" (PTE).

The PTE set forth in the condition is based on liquid fuel with a sulfur content of 0.25 percent by weight. If the actual sulfur content of the fuel is greater than these assumptions, the assessable emissions calculations provided by the Permittee should reflect the actual sulfur content.

Condition 3 and Section 7, Visible Emissions Standard

Applicability: This regulation applies to all "fuel-burning equipment" in Alaska. The emission units "Heaters and Boilers" are fuel-burning equipment. The Rig/Camp engines and light plants are classified as nonroad engines, which are not included in the definition of "fuel-burning equipment".

Factual Basis: Condition 3 requires the Permittee to comply with the federal and the state visible emission standards applicable to fuel-burning equipment and incinerators. The Permittee shall not cause or allow the equipment to violate these standards.

This condition has recently been adopted into regulation as a standard condition. MR&R requirements are listed in Section 7 of the permit.

Monitoring – The visible emissions must be observed for all emission units operated more than seven consecutive days during a calendar year at the site governed by this permit using the Method-9 plan as detailed in Section 7.

Recordkeeping - The Permittee is required to record the results of all visible emission observations and record any actions taken to reduce visible emissions.

Reporting - The Permittee is required to report: 1) emissions in excess of the federal and the state visible emissions standard and 2) deviations from permit conditions. The Permittee is required to include copies of the results of all visible emission observations with the operating report.

Condition 4 and Section 7, Particulate Matter (PM) Standard

Applicability: This regulation applies to operation of all "fuel-burning equipment" in Alaska. The emission units "Heaters and Boilers" are fuel-burning equipment. The Rig/Camp engines and light plants are classified as nonroad engines, which are not included in the definition of "fuel-burning equipment".

Factual Basis: Condition 4 requires the Permittee to comply with the state PM (also called grain loading) standard applicable to fuel-burning equipment. The Permittee shall not cause or allow fuel-burning equipment to violate this standard.

MR&R requirements are listed in Section 7 of the permit.

Monitoring – The Permittee is required to conduct PM emission unit testing if threshold values for opacity are exceeded.

Recordkeeping - The Permittee is required to record the results of PM emission unit tests.

Reporting - The Permittee is required to report: 1) incidents when emissions in excess of the opacity threshold values have been observed, and 2) results of PM emission unit tests. The Permittee is required to include copies of the results of all visible emission observations with the operating report.

Condition 5, Sulfur Compound Emissions

Applicability: The sulfur emission standard applies to operation of all fuel-burning equipment in the State of Alaska. The emission units "Heaters and Boilers" are fuel-burning equipment. The SIP standard for sulfur dioxide applies because it is contained in the

federally approved SIP dated October 1983. The Rig/Camp engines and light plants are classified as nonroad engines, which are not included in the definition of "fuel-burning equipment".

Factual Basis: The condition requires the Permittee to comply with the sulfur emission standard applicable to fuel-burning equipment. The Permittee may not cause or allow the affected equipment to violate this standard.

Sulfur dioxide comes from the sulfur in the liquid, hydrocarbon fuel (e.g. diesel or No. 2 fuel oil). Fuel containing no more than 0.75 percent sulfur by weight will always comply with the emission standard. For fuels with a sulfur content higher than 0.75 percent, the condition requires the Permittee to use Section 15 to calculate the sulfur-dioxide concentration using the equations to show that the standard is not exceeded.

Fuel sulfur testing will verify compliance.

Recordkeeping - The Permittee is required to record the fuel sulfur content.

Reporting – The Permittee is required to report as "state" excess emissions whenever the fuel combusted causes sulfur compound emissions to exceed the standards in this condition. The

Permittee is required to include the material balance calculations for fuel oil in the excess emissions report.

The Permittee is required to include copies of the records mentioned in the previous paragraph with the operating report.

Condition 6, Owner Requested Fuel Usage Limits

Applicability: These operating restrictions apply because the Permittee has requested them as owner requested limits.

Factual Basis: These restrictions and operating limits are derived from the modeling conducted as part of the permit revision requested through May 11, 2004 and are intended to ensure that the ambient air quality standards are maintained. The fuel usage limits contained in Table 2 of condition 6 are designed to protect the daily and annual Ambient Air Quality standards for sulfur dioxide, nitrogen dioxide, and particulate matter. Per the Minor Permit Modification dated November 16, 2006, the rolling 12 month fuel limit was changed to 1,250,000 gallons.

The multiple drill rig ambient analysis submitted by BP Exploration (Alaska) Inc. in support of their application for a minor permit for AQ0977MSS02 is also applicable to this Revision. The annual fuel consumption was lowered to 1,250,000 gallons per pad and will not cause or contribute to a violation of the Alaska Air Quality Standards provided in 18 AAC 50.010 (see Memorandum from Patrick Dunn dated February 6, 2007 attached at the end of this Statement of Basis)

Conditions 7 and 8, Owner Requested Limits for Location and Site Restrictions

Applicability: These conditions apply because the Permittee has requested them as owner requested limits.

Factual Basis: These operating restrictions are derived from the modeling conducted as part of the permit application process.

Condition 9, Owner-Requested Limit

Applicability: This condition applies because the Permittee has requested it as an owner requested limit.

Factual Basis: Condition 9 states that the permit only authorizes emissions from drilling activities that qualify as temporary construction activities as defined in 18 AAC 50.990(92). For each drill rig and associated equipment, the drilling operations will be considered a permanent activity requiring additional review by the department if the drilling operations (whether continuous or intermittent) at any well pad within an aggregated stationary source extends beyond a 24-month period. An Ambient Air Quality Analysis demonstrating protection of standards and increments will be required for approval.

Condition 10, Owner-Requested Limit for Liquid Fuel Sulfur Content

Applicability: This condition applies because the Permittee has requested it as an owner requested limit.

Factual Basis: Condition 10 requires the Permittee to use liquid fuel with a sulfur content of no greater than 0.25% in order to protect the Ambient Air Quality standard for sulfur dioxide.

Conditions 11 through 15 and Section 7, Visible Emissions and PM Monitoring Plan

Applicability: Apply because these conditions detail the monitoring, recordkeeping, and reporting required in conditions 3 and 4.

Factual Basis: Each permit term and condition must include MR&R requirements showing verifiable compliance with each permit term and condition. The Permittee must establish by actual visual observations which can be supplemented by other means, such as a defined Facility Operation and Maintenance Program that the stationary source is in continuous compliance with the State's emission standards for visible emissions and particulate matter.

These conditions detail a stepwise process for monitoring compliance with the State's visible emissions and particulate matter standards for liquid fuel-fired emission units. Equipment types covered by these conditions at the stationary source are liquid fuel-fired boilers and heaters.

Monitoring frequencies for equipment fired using liquid hydrocarbon fuels are detailed in these conditions.

Reasonable action thresholds are established in these conditions that require the Permittee to progressively address potential visible emission problems from emission units either through maintenance programs and/or more rigorous tests that will quantify whether a specific emission standard has been exceeded.

More details are found in the Factual Basis statement for conditions 3 and 4.

Conditions 16 through 20, Insignificant Emission units

Applicability: These general emission standards apply to all industrial processes, fuel-burning equipment, and incinerators regardless of size.

Factual Basis: Conditions 16 through 20 require the Permittee to comply with the general standards for insignificant emission units. The Permittee may not cause or allow their equipment to violate these standards. Insignificant emission units are not listed in the permit unless specific monitoring, recordkeeping and reporting are necessary to ensure compliance.

The Department finds that the insignificant emission units at this stationary source do not need specific monitoring, recordkeeping and reporting to ensure compliance under these conditions.

Condition 21, Good Air Pollution Control Practice

Applicability: Applies to all emission units, **except** NSPS regulated emission units.

Factual Basis: The condition requires the Permittee to comply with good air pollution control practices for all emission units.

Maintaining and operating equipment in good working order is fundamental to preventing

unnecessary or excess emissions. Standard conditions for monitoring compliance with emission standards are based on the assumption that good maintenance is performed. Without appropriate maintenance, equipment can deteriorate more quickly than with appropriate maintenance. If appropriate maintenance is not applied to the equipment, the Department may have to apply more frequent periodic monitoring requirements (unless the monitoring is already continuous) to ensure that the monitoring results are representative of actual emissions.

The Permittee is required to keep maintenance records to show that proper maintenance procedures were followed, and to make the records available to the Department. The Department may use these records as a trigger for requesting emission unit testing if the records show that maintenance has been deferred.

Condition 22, Dilution

Applicability: This state regulation applies to the Permittee because the Permittee is subject to emission standards in 18 AAC 50.

Factual Basis: The condition prohibits the Permittee from diluting emissions as a means of compliance with any standard in 18 AAC 50. No specific monitoring for this condition is practical. Other than the required annual certification, no monitoring, recordkeeping or reporting is necessary for this condition. The Permittee presently does not dilute emissions. Dilution would probably require a physical change to the stationary source. A reasonable inquiry and certification by a responsible official as to whether such changes occurred over the reporting period is sufficient to assure compliance.

Condition 23, Reasonable Precautions to Prevent Fugitive Dust

Applicability: Bulk material handling requirements apply to the Permittee because the Permittee could engage in bulk material handling, transporting, or storing; or will engage in industrial activity at the stationary source.

Factual Basis: The underlying regulation, 18 AAC 50.045(d), requires the Permittee to take reasonable action to prevent particulate matter (PM) from being emitted into the ambient air.

Condition 24, Stack Injection

Applicability: Stack injection requirements apply to the stationary source because the stationary source contains a stack or emission unit constructed or modified after November 1, 1982.

Factual Basis: The condition prohibits the Permittee from releasing materials other than process emissions, products of combustion, or materials introduced to control pollutant emissions from a stack (i.e. disposing of material by injecting it into a stack). No specific monitoring for this condition is practical. Other than the required annual certification, no monitoring, recordkeeping or reporting is necessary for this condition. The Permittee presently does not inject wastes into stacks at these stationary sources. Waste injection would probably require a physical change to the stationary sources. A reasonable inquiry and certification by a responsible official as to whether such changes occurred over the reporting period is sufficient to assure compliance. Compliance is ensured by inspections,

because the emission unit or stack would need to be modified to accommodate stack injection.

Condition 25, Open Burning

Applicability: The open burning state regulation in 18 AAC 50.065 applies to the Permittee if the Permittee conducts open burning at the stationary source.

Factual Basis: The condition requires the Permittee to comply with the regulatory requirements when conducting open burning at the stationary source.

More extensive monitoring and recordkeeping is not warranted because the Permittee does not conduct open burning as a routine part of their business. Also, most of the requirements are prohibitions, which are not easily monitored. Additional monitoring is achieved through condition 26, which requires a record of complaints.

Condition 26, Air Pollution Prohibited

Applicability: Air Pollution Prohibited requirements apply to the stationary source because the stationary source will have emissions.

Factual Basis: The condition prohibits the Permittee from causing any emission which is injurious to human health or welfare, animal or plant life, or property, or which would unreasonably interfere with the enjoyment of life or property. While the other permit conditions and emissions limitation should ensure compliance with this condition, unforeseen emission impacts can cause violations of this standard. These violations would go undetected except for complaints from affected persons. Therefore, to monitor compliance, the Permittee must monitor and respond to complaints.

The Permittee is required to report any complaints and injurious emissions. The Permittee must keep records of the date, time, and nature of all complaints received and summary of the investigation and corrective actions undertaken for these complaints and to submit copies of these records upon request of the Department.

The Department will determine whether the necessary actions were taken. No corrective actions are necessary if the complaint is frivolous or there is not a violation of 18 AAC 50.110, however this condition is intended to prevent the Permittee from prejudging that complaints are invalid.

Condition 27, Technology-Based Emission Standard

Applicability: Technology Based Emission Standard requirements apply to the stationary source because the stationary source contains equipment subject to a technology-based emission standard, such as BACT, MACT, LAER, NSPS or other "technologically feasible" determinations.

Factual Basis: The Permittee is required to take reasonable steps to minimize emissions if certain activity causes an exceedance of any technology-based emission standard in this permit. The conditions of this permit list applicable technology-based emission standards and require excess emission reporting for each standard in accordance with condition 43. Excess emission reporting under condition 43 requires information on the steps taken to

minimize emissions. The report required under condition 43 is adequate monitoring for compliance with this condition.

Condition 28, Permit Renewal

Applicability: Applies if the Permittee intends to renew the permit.

Factual Basis: The Permittee is required to submit an application for permit renewal by the specific dates applicable to each stationary source as listed in this condition. Monitoring, recordkeeping, and reporting for this condition consist of the application submittal. No additional requirements are necessary to ensure compliance with this condition.

Condition 29, Requested Emission unit Tests

Applicability: Applies because this is a standard condition to be included in all permits.

Factual Basis: The Permittee is required to conduct emission unit tests as requested by the Department. Monitoring consists of conducting the requested emission unit test, and no recordkeeping or reporting requirements are necessary to ensure compliance with this condition.

Conditions 30 through 32, Operating Conditions, Reference Test Methods, Excess Air Requirements

Applicability: Apply because the Permittee is required to conduct emission unit tests by this permit.

Factual Basis: The Permittee is required to conduct emission unit tests as set out in conditions 30 through 32. These conditions supplement the specific monitoring requirements stated elsewhere in this permit. Compliance monitoring with conditions 30 through 32 consist of the test reports required by condition 37.

Condition 33, Test Exemption

Applicability: Applies when the emission unit exhaust is observed for visible emissions.

Factual Basis: As provided in 18 AAC 50.345(a), 5/03/02, the requirements for test plans, notifications and reports do not apply to visible emissions observations by smoke readers, except in connection with required particulate matter testing.

Conditions 34 through 37, Test Deadline Extension, Test Plans, Notifications and Reports

Applicability: Apply because the Permittee is required to conduct emission unit tests by this permit.

Factual Basis: Standard conditions 18 AAC 50.345(l) - (o) are incorporated through these conditions. Because these standard conditions supplement specific monitoring requirements stated elsewhere in this permit no MR&R is required. The emission unit test itself is adequate to monitor compliance with this condition.

Condition 38, Particulate Matter (PM) Calculations

Applicability: Applies when the Permittee tests for compliance with the PM standard.

Factual Basis: The condition incorporates a regulatory requirement for PM emission unit tests. Because this condition supplements specific monitoring requirements stated elsewhere in this permit, no MR&R is required to ensure compliance with this condition.

Condition 39, Certification

Applicability: This is a standard condition to be included in all permits. Applies because every permit requires the Permittee to submit reports.

Factual Basis: This condition requires the Permittee to certify all reports submitted to the Department. To ease the certification burden on the Permittee, the condition allows the excess emission reports to be **certified** with the operating report, even though they must still be **submitted** more frequently than the operating report. This condition supplements the reporting requirements of this permit, therefore no additional MR&R is necessary to ensure compliance with this condition.

Condition 40, Submittals

Applicability: Applies because the Permittee is required to send reports to the Department.

Factual Basis: This condition requires the Permittee to send submittals to the address specified in this condition. Receipt of the submittal at the correct Department office is sufficient monitoring for this condition. This condition supplements the reporting requirements of this permit, therefore no additional MR&R is necessary to ensure compliance with this condition.

Condition 41, Information Requests

Applicability: Applies to all Permittees and incorporates a standard condition.

Factual Basis: This condition incorporates a standard condition in regulation, which requires the Permittee to submit information requested by the Department. Receipt of the requested information is adequate monitoring.

Condition 42, Recordkeeping Requirements

Applicability: Applies because the Permittee is required by the permit to keep records.

Factual Basis: The condition restates the regulatory requirements for recordkeeping, and supplements the recordkeeping defined for specific conditions in the permit. The records being kept provide adequate evidence of compliance with this requirement, therefore, no additional MR&R is required.

Condition 43, Excess Emission and Permit Deviation Reports

Applicability: Applies when the emissions or operations deviate from the requirements of the permit.

Factual Basis: This condition satisfies two State regulations related to excess emissions - the technology-based emission standard regulation and the excess emission regulation. Although there are some differences between the regulations, the condition satisfies the requirements of each regulation.

The reports themselves and the other monitoring records required under this permit provide an adequate monitoring of whether the Permittee has complied with the condition. Therefore, no additional MR&R is necessary to ensure compliance with this condition. Please note that there may be additional federally required excess emission reporting requirements.

Condition 44, Operating reports

Applicability: Applies to all permits.

Factual Basis: The condition restates the requirements for reports listed in regulation. The condition supplements the specific reporting requirements elsewhere in the permit and does not need any MR&R. The reports themselves are adequate monitoring for compliance with this condition.

Condition 45, Annual Compliance Certification

Applicability: Applies to all Permittees.

Factual Basis: This condition specifies the periodic compliance certification requirements, and specifies a due date for the annual compliance certification. Because this requirement is a report, no MR&R is needed.

Conditions 46 through 52, Standard Conditions

Applicability: Apply because these are standard conditions to be included in all permits.

Factual Basis: These are standard conditions required for all operating permits.

Condition 53, Permit Shield

Applicability: Applies because the Permittee has requested a shield for the applicable requirements listed under this condition.

Factual Basis: Table 3 of Operating Permit No. AQ0455TVP01 shows the permit shields that the Department granted to the Permittee. Should any of these shielded requirements become applicable, the Permittee is required to take necessary steps to comply with all applicable requirements in a timely manner. The following table shows the requests that were denied and the reasons that they were denied. The Department based the determinations on the permit application, past operating permit and inspection reports.

Table E - Permit Shields Denied

SHIELD REQUESTED FOR:	REASON FOR SHIELD REQUEST:	REASON FOR REQUEST DENIAL:
Stationary Source-Wide		
18 AAC 50.045(b) – Prohibitions	The permit implements all applicable air quality requirements for the stationary source. Since compliance with the permit will constitute compliance with applicable local, state, or federal air quality laws, this requirement is not applicable to the stationary source.	These prohibitions are ongoing requirements and therefore cannot be shielded. They have not been placed in the permit because they add no value to the permit with respect to controlling stationary source emission units. These prohibitions remain in effect because they are in regulation whether they appear in the stationary source operating permit or not. Shielding the applicant from subparagraph (b) for instance would have the effect of shielding the applicant from all requirements contained in the Air Quality Control Regulations including the requirement to obtain a permit if the shield requested is granted.
18 AAC 50.045(c) – Prohibitions	This requirement will be implemented through 18 AAC 50.201, which is otherwise addressed in the permit. This requirement is not applicable because the Department will impose any special requirements to protect ambient air quality through permit conditions adopted under 50.201.	

SHIELD REQUESTED FOR:	REASON FOR SHIELD REQUEST:	REASON FOR REQUEST DENIAL:
AQC Permits 9573-AA016, -AA017, -AA018, -AA019, and -AA020 Conditions 1, 3-4, 11-14, 17-19, and 22	These permit conditions are not "stationary source specific requirements". Therefore, they are not required in the Title V application [ref. 18 AAC 50.335(e)(5)]	There is no need to shield the Permittee from requirements of previous operating permits. According to state regulation 18 AAC 50.340(i) Permit Continuity an operator must comply with a permit issued before January 18, 1997 until the department issues a Title V operating permit. Therefore, there is no reason to shield BPXA from a permit that they no longer need to comply with once this operating permit is issued. Stationary source-specific conditions from permit numbers 9573-AA016, -AA017, -AA018, -AA019, and -AA020 that need to be carried forward or need not be carried forward into this operating permit according to regulation 18 AAC 50.350(d)(1)(D) have been identified in Table B of the basis.
AQC Permits 9573-AA016, -AA017, -AA018, -AA019, and -AA020 Condition 2	The proposed Title V permit conditions have included the most stringent applicable emission standards. This requirement is no longer needed.	
AQC Permits 9573-AA016, -AA017, -AA018, -AA019, and -AA020 Exhibit B, Short-term operating/emission limits or estimates	The short-term emission estimates/limits are not enforceable.	

MEMORANDUM

State of Alaska
Department of Environmental Conservation
Division of Air Quality

TO: Robert Dolan
Environmental Engineer Associate
Air Permits Program

DATE: May 19, 2004

FILE NO.: 455TVP01

THRU: Jim Baumgartner
Operating Permits, Acting Supervisor
Air Permits Program

PHONE: 465-5100
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Sally Ryan
Construction Permits, Acting Supervisor
Air Permits Program

FROM: Alan Schuler, P.E.
Environmental Engineer
Air Permits Program

SUBJECT: Review of BPXA Multiple Rig Ambient Assessment

This memorandum summarizes my findings regarding the multiple drill rig ambient analysis submitted by BP Exploration (Alaska) Inc. (BPXA). BPXA submitted the analysis in support of their March 18, 2004 application for a Significant Operating Permit Revision to Air Quality Control Operating Permit 455TVP01. As described in this memorandum, BPXA's assessment adequately shows that operating their emission units within the requested constraints will not cause or contribute to a violation of the Alaska Ambient Air Quality Standards (AAAQS) provided in 18 AAC 50.010.

Permit 455TVP01 currently limits drilling operations to less than 24-months per pad. This provision pertains to "temporary construction activities" under 18 AAC 50.990(92). Emissions associated with temporary construction activities do not consume increment per 18 AAC 50.215(b)(2)(A).

BACKGROUND

BPXA is currently allowed, under Air Quality Control Operating Permit 455TVP01, to operate up to five transportable drilling rigs within a bounded area of the Alaska North Slope. The bounded area is referred as the "North Slope Drilling Area." The boundaries are the Colville River, the Canning River, within three miles of the Beaufort Sea shore-line, and latitude 69^0 30'. BPXA must also constrain their drilling operations as follows:

- limit operation of each "source group" to the annual hours shown in Table 2 of the permit (Permit Condition 6)
- limit the emission units to the drilling rigs (or equivalent) listed in the permit (Condition 9);
- do not operate a drilling rig on the same pad or within a quarter mile of another pad on which another drilling rig or test flare is simultaneously operating (Condition 10);

- do not intermittently or continuously operate a transportable drilling rig and associated equipment for more than 24 consecutive months per site (Condition 11); and
- limit the maximum sulfur content of diesel fuel to 0.30 percent, by weight (Condition 13).

The above restrictions originated in Air Quality Control Permits 9573AA016 through 9573AA020, which the Department carried forward into a combined Title V permit (455TVP01). The restrictions are based on several air quality modeling analyses submitted by BPXA in the mid-1990's.

BPXA desires to increase their operational flexibility. On February 2, 2004, BPXA submitted an ambient analysis for "Two Rig Drilling Operations" which incorporated a combined fuel limit (instead of group limits). However, BPXA's analysis also assumed the ambient air boundary would be established 400-meters outward from pad edge. This "exclusion zone" approach requires land owner permission to preclude public access within the ambient air boundary, and an access control plan for maintaining the boundary. This approach is cumbersome. In addition land owners may not preclude public access over navigable waters.

BPXA submitted a revised ambient analysis with their March 18, 2004 application. The revised analysis eliminated the need for an exclusion zone by reducing annual fuel consumption, revising emission factors and stack parameters, and eliminating use of a camp incinerator. However, BPXA maintained use of a combined fuel limit and incorporated greater flexibility in fuel sulfur content and drilling rig selection.

BPXA's proposal is classified under 18 AAC 50.375(h) as a significant permit revision. Transportable drilling rigs that operate at specific multiple locations for temporary periods of time are also considered as temporary operations under AS 46.14.215. Therefore, BPXA is required to submit an ambient impact demonstration in accord with 18 AAC 50.335(f)(2).

The Department received BPXA's ambient demonstration on March 22, 2004. I provided comments regarding the demonstration via electronic mail on April 22, 2004. BPXA provided a reply, including a revised nitrogen dioxide (NO_2) analysis on May 11, 2004. This memorandum provides my comments regarding BPXA's March 22nd sulfur dioxide (SO_2), particulate matter (PM-10) and carbon monoxide (CO) analysis, and their May 11th NO_2 analysis.

APPROACH

BPXA used computer analysis (modeling) to predict the ambient NO_2, SO_2, PM-10 and CO air quality impacts. SECOR International Incorporated (SECOR) conducted the analysis on behalf of BPXA.

BPXA developed a worst-case, generic approach for characterizing the drilling operations. They assumed two drilling rigs are concurrently operating on the pad, in order to make the assessment applicable for multiple rig operations. They assumed all drilling and support equipment emissions are vented through a single, worst-case stack. This approach allowed BPXA to use a combined fuel limit in the analysis, rather than the current group limits. BPXA used a generic well pad for the analysis.

BPXA reviewed the North Slope Drilling Area to find cases where the drilling impacts would overlap the impacts from permanent emission units. They selected the following two scenarios as "worst-case conditions:"

1) drilling on a satellite pad with permanent emission units; and
2) drilling on a satellite pad with no permanent emission units, but located near an oil or gas processing facility.

The well pad with the largest existing permanent emission units is Milne Point Unit (MPU) C-Pad. The C-Pad inventory consists of two heaters, one turbine and two reciprocating engines. Therefore, BPXA characterized the C-Pad units as if they were located on the generic pad in Scenario 1. To avoid site-specific geometry issues (i.e., to keep the analysis generic), BPXA collocated each C-Pad emission unit.

BPXA examined the existing well pad locations relative to existing processing facilities to select a worst-case near-field inventory and geometry (based on overlapping impacts dues to predominate wind directions) for Scenario 2. BPXA selected the Prudhoe Bay Unit (PBU) Q Pad and Gathering Center 2 (GC-2) distance and geometry as worst-case. Therefore, BPXA included the GC-2 emission units in Scenario 2 and placed them in the same relative location to the generic pad as they would be relative to Q Pad.

BPXA's approach represents the worst-case inventory and geometry condition for most North Slope well pads. However, it does not represent the worst-case inventory for pads with large-scale process equipment collocated with drilling activities, such as Northstar, Endicott and Badami. Therefore, BPXA's approach is not applicable for drilling operations conducted at locations where drilling and processing concurrently take place.

Model Selection

BPXA used the U.S. Environmental Protection Agency's (EPA) *Industrial Source Complex Short-Term 3 (ISCST3)* model for the ambient analysis. ISCST3 is an appropriate model for this analysis. BPXA used the current version of ISCST3 (version 02035).[9]

BPXA used "source groups" in order to model both scenarios in a single run (for each modeled pollutant and meteorological data year). The Scenario 1 source group, "MPU_AG," consisted of the generic rig, the C-Pad units, and the other MPU emission units (as "off-site" sources). The Scenario 2 source group, "GC2_AG," included the generic rig and the GC-2 emission units as off-site sources. Off-site sources are further discussed in the "Off-site Impact" section of this memorandum.

BPXA made a minor error in the SO_2, PM-10 and CO Scenario 1 source groups. When using ISCST3, modelers use eight character names to identify the modeled emission units. Modelers must then include these names in the command creating the source group in order for ISCST3 to know which units are included in the source group. BPXA made typographical errors when referencing two off-site 30 million BTU per hour gas heaters in the Scenario 1 source group.[10] Therefore, ISCST3 did not include the impacts from these heaters in the Scenario 1 output.

[9] In many recent applications, SECOR has modified ISCST3 to better account for horizontal/capped stacks. SECOR *did not* use their modified version for this application. They instead used EPA's release of ISCST3.

[10] The H5302A heater was labeled as PU5302A, and the H5302B heater was labeled as PU5302B, in the Scenario 1 source group. BPXA made this same error in the March NO_2 analysis, but corrected the error in the May submittal.

Gas heaters have fairly small SO_2, PM-10 and CO emissions. These heaters are also off-site, which means they have minimal impacts in the area of interest. For these reasons, I did not ask BPXA to correct these errors for this analysis. However, BPXA should correct these errors in future submittals.

Meteorological Data
ISCST3 requires hourly meteorological data to estimate plume dispersion. According to EPA's *Guideline on Air Quality Models*, five years of representative data should be used, when available, to account for year-to-year variation.

BPXA used the same meteorological data as used in the previous drill rig assessments. BPXA used five years (1991-1995) of surface data collected at PBU Pad A and concurrent upper air data from the National Weather Service (NWS) station in Barrow. These data are appropriate for this analysis.

Ambient Air Boundary and Receptor Grid
For purposes of air quality modeling, "ambient air" means outside air to which the public has access. Ambient air typically excludes that portion of the atmosphere within a source's boundary.

BPXA used the edge of the generic well pad as the ambient air boundary. They used the following receptor grid density:

- 25-meter spacing along the pad edge,
- 25-meter resolution from pad edge outward to at least 100 meters,
- 100-meter resolution from the 25-meter grid outward to 1 kilometer in each cardinal direction, and
- 250-meter resolution from the 100-meter grid outward to 2 kilometers in each cardinal direction.

BPXA also placed a 25-meter grid along the GC-2 pad edge. By using a 25-meter grid at both GC-2 and the generic well pad, BPXA was able to estimate the maximum near-field impact at both locations (i.e., the maximum impact due to plume overlap from the generic well pad at GC-2 and the maximum impact due to plume overlap from GC-2 at the generic well pad). BPXA's receptor grid is illustrated in Figure 3-2 of their March 2004 submittal. The ambient boundary and receptor grid is adequate and appropriate for this analysis.

Load Screening Analysis
The Department frequently asks applications to conduct a load analysis of their larger emission units to determine the worst-case stack conditions. BPXA assumed all operations occur under full load. This is an appropriate assumption for drilling operations.

Emission Rates and Stack Parameters
BPXA included drill rig units and support equipment in the generic analysis. The rig units include drill rig engines, boilers and heaters. The support equipment includes camp generators, light plants, and a snow melter. BPXA dropped the currently permitted camp incinerator from the analysis in order to demonstrate compliance with the AAAQS. BPXA did not include a flare in the permit application and did not include a flare in the analysis.

BPXA compared the stack parameters for most of the rig and support equipment units to determine the worst-case stack conditions.[11] The maximum impacts from drilling operations occur in the immediate near-field. Therefore, BPXA conducted the analysis using a modified version of EPA's "M-Factor" to find the stack with the least buoyant plume (i.e., the stack that would provide the maximum near-field impacts). BPXA then used this worst-case stack to model the combined emissions. The rig boilers and heaters have the worst-case stack parameters (they have identical stack designs).[12]

BPXA used PM-10 emission rates instead of the previously assumed total particulate emissions. The PM-10 emission rates are correctly based on EPA's AP-42 emission factors.

In the March submittal, BPXA assumed the rig boilers and heaters operate on par with the rig engines (i.e., when the engines are running at full load, the boilers/heaters are also running at full load). This is an unreasonable assumption for estimating the annual average NO_2 impacts since the boilers/heaters operate according to ambient temperature, not drilling conditions.

BPXA revised their approach in the May 2004 submittal by assuming the boilers/heaters operate on par with monthly average temperature. When using this approach, the boilers/heaters operate 63 percent of the time at full load and 37 percent of the time at 10 percent load. In terms of fuel consumption, this usage is equivalent to operating the boilers/heaters 67 percent of the time at full load, and not operating them the rest of the year. BPXA's revised approach is reasonable.

Downwash

Downwash refers to conditions where the plume pattern is influenced by nearby structures. Downwash can occur when a stack height is less than a height derived by a procedure called "Good Engineering Practice," as defined in 18 AAC 50.910(43). The modeling of downwash-related impacts requires the inclusion of dimensions from nearby buildings. EPA has established specific algorithms for determining which buildings must be included and for determining the profile dimensions that would be "seen" by a given stack. They have also incorporated these algorithms in a separate computer program called the "Building Profile Input Program" (BPIP).

BPXA used BPIP (version 95086) to determine the building profiles needed by ISCST3. This was the current version of BPIP at the time BPXA conducted the analysis.[13]

Ambient NO_2 Modeling

The modeling of ambient NO_2 concentrations can sometimes be refined through the use of ambient air data or assumptions. BPXA used the national default ambient NO_2-to-NOx ratio of

[11] Per my direction, BPXA did not include the light plant stacks in the stack comparison. Light plant engines and stacks are very small. Therefore, light plant stacks are not representative of the typical stack associated with drilling operations. BPXA eliminated the camp snow melter stack for the same reason.

[12] The stack parameters originally used for the Caterpillar D3412 engine (rig engine and camp generator) are incorrect. Therefore, BPXA updated the stack parameters for the rig generator in the May 11, 2004 submittal. BPXA should have also updated the camp generator stack parameters. However, this omission does not affect the conclusion regarding the worst-case stack, and is therefore, moot. The update did not change the previous conclusions.

[13] EPA released a new version of BPIP (04112) on April 29, 2004. EPA only changed the number of buildings and emission units that can be processed in a single run. They did not revise the actual downwash algorithms. Therefore, version 95086 provides the same downwash parameters as 04112.

0.75, as provided in EPA's *Guideline on Air Quality Models*, to refine the estimated ambient NO_2 concentrations. The 0.75 ratio is appropriate for this analysis.

Ambient SO_2 Modeling

SO_2 emissions are directly related to the amount of sulfur in the fuel. The current permit limits the maximum fuel sulfur content to 0.30 percent, by weight. BPXA requested this limit be lowered to 0.25 percent, by weight, or 2,500 parts per million by weight (ppmw). BPXA also proposed a prorated daily fuel consumption limit based on fuel sulfur content.
BPXA developed a base case where the drilling operations could burn 18,000 gallons of fuel per day, when using fuel with a 1,500 ppmw sulfur content. This results in an SO_2 emission rate of 15.0 pounds per hour (lb/hr). If the fuel sulfur content increases to 2,000 ppmw, then the daily fuel consumption must be reduced to 13,400 gallons to maintain the 15.0 lb/hr SO_2 emission rate. If the sulfur content increases to 2,500 ppmw, then the daily fuel consumption must be further reduced to 10,800 gallons. BPXA asked the Department to incorporate these daily fuel limits into the permit in order to protect the 24-hour SO_2 AAAQS.

EPA allows applicants to compare the high second-high (h2h) modeled concentration to the short-term air quality standards and increments if at least one year of temporally representative site-specific, or five years of representative off-site data, are used. When these criteria are not met, applicants must use the high first-high (h1h) estimate. In all cases, applicants must compare the h1h modeled concentration to annual average standards and increments. I allowed BPXA to compare the h2h modeled concentrations to the short-term standards and increments since they used five years of meteorological data.

Ambient PM-10 Modeling

EPA allows applicants to compare the highest sixth-high (h6h) concentration over a five-year meteorological period to the 24-hour PM-10 ambient air quality standard. This approach is less conservative than using the h2h concentration in any one-year, but better matches the PM-10 monitoring method upon which the standard is based. I allowed BPXA to compare the h6h modeled concentration to the 24-hour PM-10 AAAQS since they used five years of meteorological data.

Off-site Impacts

The ambient analysis must address potential air quality impacts from off-site facilities. These impacts are typically assessed through modeling.

As previously noted, BPXA included the MPU emission units as off-site sources in Scenario 1 and the GC-2 emission units as off-site sources in Scenario 2. BPXA assumed the impacts from other North Slope sources are represented in the background concentration. BPXA's approach regarding off-site sources is appropriate. The GC-2 inventory and parameters are consistent with previous assessments.

BPXA has made several recent revisions at MPU. Therefore, I compared the MPU parameters to those previously modeled. The MPU emission unit inventory is correct. Some of the emission rates are larger than previously modeled. In a few cases, the SO_2 and PM-10 emission rates for the smaller heaters are less than previously modeled. However, the total MPU emissions are more than what BPXA previously modeled. Therefore, the modeled MPU emission rates are acceptable for this application. The MPU stack parameters are also acceptable.

Background Concentrations

The background concentration represents impacts from sources not included in the modeling analysis. Typical examples include natural, area-wide, and long-range transport sources. The background concentration must be evaluated on a case-by-case basis for each ambient impact analysis. Once the background concentration is determined, it is added to the modeled concentration to estimate the total ambient concentration.

BPXA used the highest concentrations measured at either PBU Pad A (January 1, 2000 through December 31, 2002) or Kuparuk River Unit (KRU) Drill Site 1F (July 1, 2001 through June 30, 2002) to represent the background concentrations for the North Slope Drilling Area. These stations were sited to measure the general ambient concentrations within PBU and KRU. Therefore, these data represent appropriate background concentrations.

RESULTS AND DISCUSSION

The maximum Scenario 1 and Scenario 2 AAAQS impacts are shown below in Tables 1 and 2, respectively. The background concentrations, total impacts and AAAQS are also shown. As shown in Tables 1 and 2, the total impacts are less than the respective AAAQS. Therefore, BPXA has demonstrated compliance with the AAAQS.

Table 1 – Maximum Scenario 1 AAAQS Impacts
Multiple Rig Operation with Permanent On-Site Units
(e.g., MPU C-Pad)

Air Pollutant	Avg. Period	Maximum Modeled Conc ($\mu g/m^3$)	Bkgd Conc ($\mu g/m^3$)	TOTAL IMPACT: Max conc plus bkgd ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
NO_2	Annual	88.1	7.5	**96**	100
SO_2	3-hr	633.5	28.8	**662**	1,300
	24-hr	276.9	13.1	**290**	365
	Annual	13.4	0	**13**	80
PM-10	24-hr	75.8	60.4	**136**	150
	Annual	2.0	6.2	**8**	50
CO	1-hr	3,172	1,150	**4,322**	10,000
	8-hr	1,598	575	**2,173**	40,000

Table 2 – Maximum Scenario 2 AAAQS Impacts
Multiple Rig Operation without Permanent On-Site Units
(e.g., GC-2 Q-Pad)

Air Pollutant	Avg. Period	Maximum Modeled Conc ($\mu g/m^3$)	Bkgd Conc ($\mu g/m^3$)	TOTAL IMPACT: Max conc plus bkgd ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
NO_2	Annual	90.6	7.5	**98**	100

SO_2	3-hr	608.4	28.8	**637**	1,300
	24-hr	270.2	13.1	**283**	365
	Annual	13.8	0	**14**	80
PM-10	24-hr	53.5	60.4	**114**	150
	Annual	3.9	6.2	**10**	50
CO	1-hr	3,165	1,150	**4,315**	10,000
	8-hr	1,483	575	**2,058**	40,000

It is important to note that since ambient concentrations vary with distance from each source, the maximum values shown represent the highest value that may occur somewhere in the local airshed. They do *not* represent the highest concentration that could occur at *all* locations in the area.

CONCLUSION

I reviewed BPXA's multiple rig modeling analysis and concluded the following:

1. The NO_2, SO_2, PM-10 and CO emissions associated with operating the stationary source within the requested operating limits will not cause or contribute to a violation of the AAAQS provided in 18 AAC 50.010; and
2. BPXA conducted the analysis in a manner consistent with EPA's *Guideline on Air Quality Models*.

BPXA incorporated several assumptions and requested operating limits in their ambient demonstration, which should be included in the operating permit. Therefore, please incorporate permit conditions that address the following items. These conditions are needed to protect the AAAQS and increments.

1. Limit the annual fuel consumption to 1,350,000 gallons per pad.[14]

2. Limit the maximum fuel sulfur content to 0.25 percent, by weight (2,500 ppmw).

3. Limit the daily fuel consumption as follows:
   - 18,000 gallons when the fuel sulfur content is no greater than 1,5000 ppmw;
   - 13,440 gallons when the fuel sulfur content is no greater than 2,000 ppmw; and
   - 10,880 gallons when the fuel sulfur content is no greater than 2,500 ppmw.

4. Remove the incinerator from the emission unit inventory.

5. Do not list a flare in the emission unit inventory or authorize flaring activities.

6. Preclude use of this permit (455TVP01) at pads with equipment that separates sales oil from the process stream.

7. Develop monitoring, record keeping, and reporting consistent to the revised ambient air quality operating limits and durations listed above.

[14] BPXA requested an annual limit of 1,500,000 gallons in the March 2004 submittal, but changed their request to 1,350,000 gallons in the May submittal. The revised fuel limit is needed to protect the annual average NO_2 AAAQS.

BPXA demonstrated compliance by assuming multiple rigs are operating on the same pad. Therefore, we may also drop Condition 10 from the existing permit.

The permit must clearly state that the authorization is limited to temporary construction activities. BPXA will need to demonstrate compliance with the NO_2, SO_2 and PM-10 increments if they desire to conduct long-term drilling operations.

I also recommend changing the phrase "*operating* permit" in paragraph 3 of page 1 of 455TVP01 to "*air quality* permit" so that it encompasses *both* operating and construction permits.

AES/cmd

cc: Cynthia Espinoza, ADEC/AQ/AP Anchorage
Jack Coutts, ADEC/AQ/AP Deadhorse

MEMORANDUM

State of Alaska
Department of Environmental Conservation
Division of Air Quality

TO: File

DATE: February 12, 2007

FILE NO.: AQ0977MSS02 - Modeling

THRU: Alan Schuler, P.E
Environmental Engineer
Air Permits Program

PHONE: 269-7577
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FROM: Patrick Dunn.
Environmental Engineer Assistant
Air Permits Program

SUBJECT: Review of Revised BPXA
Multiple Rig
Ambient Assessment

This memorandum summarizes the Department's findings regarding the multiple drill rig ambient analysis submitted by BP Exploration (Alaska) Inc. (BPXA). BPXA submitted the analysis in support of their November 16, 2006 application for a minor permit to revise Air Quality Control Minor Permit AQ0977MSS01. This analysis is also in support of BPXA's November 28, 2006 application for a Significant Operating Permit Revision to Air Quality Control Operating Permit AQ0455TVP01, Revision 1. As described in this memorandum, BPXA's assessment adequately shows that operating their emission units within the requested constraints will not cause or contribute to a violation of the Alaska Ambient Air Quality Standards (AAAQS) provided in 18 AAC 50.010.

BPXA had previously submitted an analysis in support of their March 18, 2004 application for a Significant Operating Permit Revision to Air Quality Control Operating Permit AQ0455TVP01. This previous analysis was also used to support their December 2, 2005 application for Air Quality Control Minor Permit AQ0977MSS01. The Department approved BPXA's previous ambient analysis and the findings are documented in the May 19, 2004 memorandum, "Review of BPXA Multiple Rig Ambient Analysis." Today's memorandum only addresses those items that have changed subsequent to the May 19, 2004 memorandum.

Permits AQ0455TVP01, Revision 1 and AQ0977MSS01 currently limit drilling operations to less than 24-months per pad. This provision pertains to "temporary construction activities" under 18 AAC 50.990(92). Emissions associated with temporary construction activities do not consume increment per 18 AAC 50.215(b)(2)(A).

BACKGROUND COMMENTS

BPXA is currently allowed, under Air Quality Control Operating Permit AQ0455TVP01, Revision 1 to operate up to twelve transportable drilling rigs at aggregated well pads within a

bounded area of the Alaska North Slope. The bounded area is referred as the "North Slope Drilling Area." The boundaries are the Colville River, the Canning River, within three miles of the Beaufort Sea shore-line, and latitude 69° 30'). BPXA is also allowed, under Air Quality Control Minor Permit AQ097MSS01 to operate up to twelve transportable drilling rigs at unaggregated well pads within the same bounded area.

BPXA recently discovered that the ambient analysis submitted in support of Air Quality Control Operating Permit AQ0455TVP01, Revision 1 and Air Quality Control Minor Permit AQ0977MSS01 contained incorrect emission rates. BPXA found that the Milne Point Unit (MPU) C-Pad emission rates did not match those documented in a July 17, 2002 revision to the C-Pad Title V permit application. In addition to the incorrect C-Pad emission rates, emission rates for MPU emission units did not match emissions documented in Attachment AA of the Statement of Basis for Air Quality Control Operating Permit AQ0200TVP01.

BPXA has corrected these emission rates in their current ambient analysis submitted with their November 16, 2006 application to revise Air Quality Control Minor Permit AQ0977MSS01. This revised modeling analysis shows that the aggregate rolling twelve month fuel limits defined in Air Quality Control Operating Permit AQ0455TVP01, Revision 1 and Air Quality Control Minor Permit AQ0977MSS01 should be reduced from 1,350,000 gallons to 1,250,000 gallons. Daily fuel limits and short term emission rates remain unchanged from the previous ambient analysis.

BPXA modeled two scenarios using the same source groups as in their previous ambient analysis and corrected a minor source group error documented in the previous memorandum. No emission rates for Scenario 2 emission units increased in the current ambient analysis. Although BPXA was not required to submit an analysis for Scenario 2, BPXA did include Scenario 2 in the current ambient analysis and the Department has included the results in this memorandum.

RESULTS AND DISCUSSION

The revised maximum Scenario 1 and Scenario 2 AAAQS impacts are shown below in Tables 1 and 2, respectively. The background concentrations, total impacts and AAAQS are also shown. As shown in Tables 1 and 2, the total impacts are less than the respective AAAQS. Therefore, BPXA has demonstrated compliance with the AAAQS.

Table 1 – Maximum Scenario 1 AAAQS Impacts
Multiple Rig Operation with Permanent On-Site Units
(e.g., MPU C-Pad)

Air Pollutant	Avg. Period	Maximum Modeled Conc ($\mu g/m^3$)	Bkgd Conc ($\mu g/m^3$)	TOTAL IMPACT: Max conc plus bkgd ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
NO_2	Annual	89.6	7.5	**97**	100
SO_2	3-hr	658	28.8	**687**	1,300
	24-hr	290	13.1	**303**	365
	Annual	12.5	0	**13**	80

PM-10	24-hr	74.2	60.4	**135**	150
	Annual	2.8	6.2	**9**	50
CO	1-hr	3,268	1,150	**4418**	10,000
	8-hr	1,675	575	**2,250**	40,000

Table 2 – Maximum Scenario 2 AAAQS Impacts
Multiple Rig Operation without Permanent On-Site Units
(e.g., GC-2 Q-Pad)

Air Pollutant	Avg. Period	Maximum Modeled Conc ($\mu g/m^3$)	Bkgd Conc ($\mu g/m^3$)	TOTAL IMPACT: Max conc plus bkgd ($\mu g/m^3$)	Ambient Standard ($\mu g/m^3$)
NO_2	Annual	84.4	7.5	**92**	100
SO_2	3-hr	608.4	28.8	**637**	1,300
	24-hr	270.2	13.1	**283**	365
	Annual	11.5	0	**12**	80
PM-10	24-hr	53.5	60.4	**114**	150
	Annual	3.9	6.2	**10**	50
CO	1-hr	3,165	1,150	**4,315**	10,000
	8-hr	1,578[a]	575	**2,153**	40,000

a – The Department noted that this value increased from the previous ambient analysis although the emissions rates for Scenario 2 did not increase. The Department did not believe pursuing the cause was worthwhile because the total impact is much less than the ambient standard.

It is important to note that since ambient concentrations vary with distance from each source, the maximum values shown represent the highest value that may occur somewhere in the local airshed. They do *not* represent the highest concentration that could occur at *all* locations in the area.

CONCLUSION

I reviewed BPXA's multiple rig modeling analysis and concluded the following:

1. The NO_2, SO_2, PM-10 and CO emissions associated with operating the stationary source within the revised operating limit will not cause or contribute to a violation of the AAAQS provided in 18 AAC 50.010; and
2. BPXA conducted the analysis in a manner consistent with EPA's *Guideline on Air Quality Models*.

BPXA incorporated the revised annual fuel consumption in their ambient demonstration, which should be included in the revised minor permit and revised operating permit. Therefore, please

incorporate a permit condition that addresses the following item. This condition is needed to protect the AAAQS.

1. Reduce the annual fuel consumption to 1,250,000 gallons per pad.

PED/slb

cc: Jim Baumgartner, ADEC/APP, Juneau
Cynthia Espinoza, ADEC/APP, Anchorage
P. Moses Coss, ADEC/APP, Fairbanks